Final

Shaw Air Force Base
Capital Improvement Program

Environmental Assessment

United States Air Force

Air Combat Command
20th Fighter Wing
Shaw AFB, South Carolina

May 2010

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ACRONYMS AND ABBREVIATIONS

20 CES	20th Civil Engineer Squadron
20 CS	20th Communications Squadron
20 FW	20th Fighter Wing
ACAM	Air Conformity Applicability Model
ACC	Air Combat Command
ACM	asbestos-containing material
AFB	Air Force Base
AFM	Air Force Manual
AICUZ	Air Installation Compatible Use Zone
Air Force	United States Air Force
AMU	Aircraft Maintenance Unit
APZ	Accident Potential Zone
ARCENT	3rd Army/Army Central Command
ASOS	Air Support Operations Squadron
AT/FP	Anti-Terrorism/Force Protection
BMP	Best Management Practice
BRAC	Base Realignment and Closure
BREC	Black River Electric Cooperative
BX	Base Exchange
C&D	construction and demolition
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIP	Capital Improvement Program
CMHP	Carolina Mobile Home Park
CMS	Corrective Measures Study
CO	carbon monoxide
CWA	Clean Water Act
CZ	Clear Zone
dB	decibel
dBA	A-weighted decibel
DDESB	Department of Defense Explosives Safety Board
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DRO	Diesel-Range-Organics
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FY	Fiscal Year
GHG	greenhouse gas
gpm	gallons per minute
HAZMART	Hazardous Materials Pharmacy
HMMP	Hazardous Material Management Process
HQ	Headquarters
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
JCLUS	Joint Compatible Land Use Study
LBP	lead-based paint
L_{dn}	Day-Night Average Sound Level
LOS	Level of Service
LUC	land use control
MFH	Military Family Housing
mgd	million gallons per day
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPS	nonpoint source
NRHP	National Register of Historic Places
O_3	ozone
OWS	oil/water separator
PCE	perchloroethylene
PECR	Poinsett Electronic Combat Range
PL	Public Law
PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
PMAI	Primary Mission Aircraft Inventory
POL	petroleum, oil and lubricant
ppm	parts per million
Q-D	Quantity-Distance
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
RV	Recreational Vehicle
SCDHEC	South Carolina Department of Health and Environmental Control
SCPDES	South Carolina Pollutant Discharge Elimination System
SF	Square Feet
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SWPPP	Stormwater Pollution Prevention Plan
SY	Square Yard
TCE	trichloroethylene
U.S.	United States
UFC	Unified Facilities Criteria
ug/m^3	micrograms per cubic meter
USACE	United States Army Corps of Engineers
USAFCENT	United States Air Forces Central Command
USARCENT	United States Army Forces Central Command
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VOC	volatile organic compound
WINDO	Wing Infrastructure Development Outlook
WWTP	Wastewater Treatment Plant

FINDING OF NO SIGNIFICANT IMPACT

NAME OF THE PROPOSED ACTION

Capital Improvement Program (CIP) at Shaw Air Force Base (AFB), South Carolina.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The United States Air Force (Air Force) proposes to implement the CIP and the associated construction, demolition and infrastructure projects. Components of the CIP include road realignments and infrastructure improvements in order to facilitate traffic flow on base and on roads immediately off base. Facilities would be constructed or renovated in order to collocate similar mission functions to improve mission efficiency and synergy. Outdated facilities would be demolished to provide opportunities for future base development. No additional personnel would be located at Shaw AFB from the implementation of the CIP. This Environmental Assessment (EA) analyzes the impacts associated with the implementation of the Proposed Action, Alternative 1 and the No Action alternative. The alternative action would consist of the projects included in the Proposed Action in different locations and an emphasis on renovating existing facilities rather than demolition and new construction. Under the No Action alternative, the CIP and the associated projects would not be implemented.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The public and agency scoping process focused the analysis on the following environmental resources: land use resources, infrastructure, socioeconomics and environmental justice, cultural resources, biological resources, water resources, air quality, hazardous materials and hazardous waste, safety and noise. As indicated in Chapter 4.0, neither the Proposed Action nor the action alternative would result in significant impacts to any resource area.

Land Use Resources: The projects under the Proposed Action and Alternative 1 would improve land use on Shaw AFB by consolidating similar mission functions into the same or adjacent facilities. The demolition of outdated facilities would provide more opportunities for future development that would be more consistent with existing land uses. The demolition of two facilities in the Clear Zone (CZ) would bring Shaw AFB into compliance with Unified Facilities Criteria (UFC) for airfield clearance. New construction and renovation would be consistent with existing base architecture and visual character. Projects at the Wateree Recreation Area would provide additional recreational services to military personnel. Road realignments and gate projects would improve the flow of traffic on the base, particularly alleviating traffic congestion at the Main Gate during peak hours. Therefore, implementation of the Proposed Action or Alternative 1 would result in positive but not significant impacts to overall land use resources.

Infrastructure: A large portion of the projects under the Proposed Action or Alternative 1 consist of demolition and replacement construction or renovation of existing facilities. All new facilities would be constructed utilizing energy efficient and water conservation technologies in accordance with the Air Force Leadership in Energy and Environmental Design (LEED) program. Therefore, a minor increase in the demand for energy and water utilities as the new

facilities are constructed is expected. However, the existing infrastructure for all energy and water components has the capacity to accommodate the increase in use. Therefore, implementation of the Proposed Action or Alternative 1 would not result in significant impacts to infrastructure.

Socioeconomic and Environmental Justice: Construction and demolition (C&D) activities and related expenditures under the Proposed Action or Alternative 1 would generate additional employment and income in the local area, primarily in the construction industry in Sumter County, South Carolina. However, the additional employment and income would be temporary and would last only for the duration of the C&D activities. Projects at the Wateree Recreation Area also have the potential to generate additional revenue for the 20th Fighter Wing (20 FW) as additional services would be available for rent by military personnel. Therefore, implementation of the Proposed Action or Alternative 1 would result in beneficial but not significant socioeconomic impacts. No adverse environmental, health, or safety impacts are expected to occur and therefore, no disproportionate impacts are expected to minority or low-income populations or children.

Cultural Resources: No significant impacts to cultural resources are expected as the projects are located in previously disturbed areas and are not sited in areas known to contain cultural resources. None of the projects would directly affect Building 611, the only National Register of Historic Places (NRHP) eligible building on Shaw AFB. If artifacts are discovered during construction or demolition activities, Shaw AFB's Cultural Resource Manager, Conservation Chief and National Environmental Policy Act (NEPA) Coordinator would be contacted immediately. All activities would stop until the site could be evaluated by a professional archaeologist as outlined in the 20 FW *Integrated Cultural Resources Management Plan.*

Biological Resources: No significant impacts to biological resources are expected as the projects are located in previously disturbed areas. Impacts would be limited to displacement of commonly occurring species and would not directly affect wetlands or aquatic communities. Threatened and endangered species and their critical habitats are not found in the project area. The closest threatened species is the Least Tern, a state threatened species, which is known to nest on the roof of the Base Exchange (BX). None of the projects under the Proposed Action or Alternative 1 would directly impact the BX or the least terns nesting habits. Best Management Practices (BMPs) including sediment control, construction and beneficial landscaping would be utilized.

Water Resources: Under the Proposed Action and Alternative 1, the projects would result in additional areas being developed and becoming impermeable to water thus increasing stormwater runoff. Preventive measures such as silt fences, storm drain inlet and outlet protection and other standard construction practices would be instituted in accordance with Shaw AFB's Stormwater Pollution Prevention Plan (SWPPP) to eliminate or reduce sediment and non-storm water discharges. For projects disturbing more than 1 acre, a South Carolina Pollutant Discharge Elimination System (SCPDES) Stormwater General Permit would be required. The groundwater system is operating within capacity and has the capacity to meet any incidental or indirect change in demand. No construction or demolition activities would

occur within wetlands or floodplains. Therefore, no significant impacts to water resources are anticipated.

Air Quality: Sumter County is in attainment for all criteria pollutants and no conformity analysis is required. Under the Proposed Action or Alternative 1, emissions from C&D activities would not exceed the established 10 percent criterion for Sumter County's emissions for each individual pollutant basis. Therefore, no significant impacts to air quality are expected.

Hazardous Materials and Hazardous Waste: All hazardous materials and construction/ demolition debris during the execution of the Proposed Action or Alternative 1 would be handled, stored and disposed of in accordance with federal, state and local regulations and laws. Hazardous waste may be generated as a result of the activities; however, storage and disposal of these wastes would be coordinated with the 20 FW Hazardous Waste Program Manager. Prior to any construction or demolition, affected facilities would be inspected to identify all asbestos-containing materials (ACMs) and lead-based paints (LBP). In the event that these materials are discovered, all waste ACM and lead-containing materials would be disposed of in accordance with the South Carolina Department of Health and Environmental Control (SCDHEC) Rule 61-86.1, as well as related federal regulations. Some of the proposed projects directly overlie Environmental Restoration Program (ERP) sites; however, none of the components of the construction or demolition activities are expected to directly interact with the ERP sites or disturb any contaminated soil or groundwater. Prior to construction or demolition activities, the contractor would coordinate with the 20 FW ERP Manager to determine the necessary notices, waivers and permits are in place. Therefore, no significant impacts are expected from the implementation of the proposed projects in relation to hazardous materials and hazardous waste.

Safety: Short-term safety risks are associated with any demolition and construction activity; however adherence to standard safety practices would minimize any potential risks. All proposed facilities would be sited in accordance with applicable anti-terrorism/force protection (AT/FP) standards and regulations including UFC 04-010-01, *DoD Minimum Antiterrorism Standards for Buildings*. The demolition of two facilities in the CZ would slightly improve safety conditions on Shaw AFB by eliminating an airfield clearance issue. Two projects, construction of an Arm/De-Arm Pad and construction of two storage igloos are proposed to be the site of storage, maintenance and handling of explosive material. Therefore, an explosive quantity-distance (Q-D) arc would be delineated for each structure depending on the type and amount of explosives to be stored or handled at each location. Under the Proposed Action, the proposed site for the Field Training Detachment Aircraft Maintenance Training Facility would be sited within an existing Q-D arc. A waiver to explosives safety policy may be required and/or the explosives safety risk could be reduced through reinforcement of the structure to be resistant to explosions. Overall, impacts to safety would be minor and not significant.

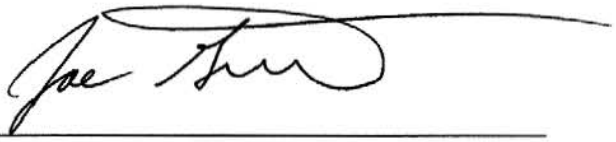
Noise: Under the Proposed Action and Alternative 1, C&D activities would result in a temporary increase in localized noise levels in the vicinity of the project areas. It is expected that construction would be limited to normal working hours between 7 a.m. and 5 p.m. Construction sound mufflers can also be used to reduce construction noise. Shaw AFB is an

active military airfield such that all of the proposed projects would be subject to noise from aircraft operations and may require additional noise attenuation. Noise impacts resulting from C&D activities and the siting of the proposed facilities in high noise areas would be adverse, but not significant.

No-Action Alternative: Under the No Action Alternative, the CIP would not be implemented and the associated projects would not be constructed. Conditions would remain unchanged from the current baseline situation.

CONCLUSION

Based on the findings of this EA conducted in accordance with the requirements of the NEPA (42 United States Code [USC] 4321-4347), Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] §§ 1500-1508) and 32 CFR Part 989, et seq., *Environmental Impact Analysis Process* (formerly known as Air Force Instruction [AFI] 32-7061) and after careful review of the potential impacts, I conclude implementation of the Proposed Action would not result in significant impacts to the quality of the human or the natural environment. Therefore, a Finding of No Significant Impact is warranted and an Environmental Impact Statement is not required for this action.



23 Apr 10

Joseph T. Guastella, Jr., Colonel, USAF
Commander, 20th Fighter Wing

Date

Final

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Air Combat Command
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May 2010

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EXECUTIVE SUMMARY

This Environmental Assessment (EA) describes the potential environmental consequences resulting from a proposal to implement the Capital Improvement Program (CIP) at Shaw Air Force Base (AFB), South Carolina. The CIP includes a number of facility and road construction, demolition and renovation projects throughout the base in order to improve mission efficiency and synergy by collocating similar functions.

ENVIRONMENTAL IMPACT ANALYSIS PROCESS

This EA has been prepared by the United States Air Force (Air Force) and the 20th Fighter Wing (20 FW) pursuant to the requirements of the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations implementing NEPA and Air Force Instruction (AFI) 32-7061 (*The Environmental Impact Analysis Process* (EIAP), as codified in 32 Code of Federal Regulations [CFR] Part 989).

PURPOSE AND NEED FOR ACTION

The purpose of the CIP is to document the projects needed over the next five to ten years and implementing infrastructure and facility improvements necessary to support the mission. The projects included in the CIP are intended to consolidate and collocate similar mission functions on the base to improve efficiency and mission synergy. Outdated facilities are to be demolished to provide opportunities for future base development. Infrastructure projects are designed to improve traffic conditions around Shaw AFB and on local roads off base. The purpose and need for each individual project are described in detail in Table 1.2-1.

PROPOSED ACTION AND ALTERNATIVES

The Proposed Action is to implement 26 projects included in the CIP. The projects include demolition of outdated facilities, construction of new facilities and renovation of existing facilities. This EA analyzes the impacts associated with the implementation of the Proposed Action, Alternative 1 and the No Action Alternative. Under Alternative 1, projects are similar to those analyzed in the Proposed Action with nine projects that would be implemented in different locations or with different construction activities. The remaining 17 projects were determined to not have a viable action alternative that would meet mission requirements and satisfy required siting criteria. Under the No Action alternative, no construction or demolition activities would take place.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This EA provides an analysis of the potential environmental consequences during the implementation of the Proposed Action, Alternative 1 and the No Action alternative. Ten resource categories received thorough evaluation to identify potential environmental

consequences. As indicated in Chapter 4.0, implementation of the Proposed Action or any action alternative would not result in significant impacts to any resource area.

Land Use Resources. The projects under the Proposed Action and Alternative 1 are intended and sited in order to improve land use on the base by consolidating similar mission functions into the same or adjacent facilities. The demolition of outdated facilities would provide more opportunities for future development that would be more consistent with existing land uses. Additionally, the demolition of buildings in the Airfield Clear Zone (CZ) would bring Shaw AFB into compliance with the Unified Facilities Criteria (UFC) for airfield clearance. A visitors' center would be constructed adjacent to the Main Gate and within Accident Potential Zone (APZ) I representing an incompatible land use. New construction and renovation would be consistent with Shaw AFB's existing architecture and visual character and would not impact visual resources. The projects proposed at the Wateree Recreation Area would provide additional services and recreational opportunities to military personnel also resulting in positive but not significant impacts. Projects for road realignments and gate improvements would improve the flow of traffic and increase the level of service at primary junctions, particularly Shaw Drive and Patrol Road and along US 76/378. Therefore, implementation of the Proposed Action or Alternative 1 would result in not significant impacts to land use resources.

Infrastructure. No changes in personnel are included in the CIP. A large portion of the projects under the Proposed Action or Alternative 1 consist of demolition and replacement construction or renovation of existing facilities. All new facilities would be constructed in accordance with the Air Force Leadership in Energy and Environmental Design (LEED) program utilizing energy efficient and water conservation technologies. There would be a minor increase in the demand for energy and water utilities as the new facilities are constructed. However, it is expected that the existing infrastructure for all of energy and water components has the capacity to accommodate the increase in use. Therefore, implementation of the Proposed Action or Alternative 1 would not result in significant impacts.

Socioeconomics and Environmental Justice. Under the Proposed Action and Alternative 1, the construction and demolition (C&D) activities and related expenditures would generate additional employment and income in the local area, particularly in the construction industry. However, the additional employment would be temporary and would last only for the duration of the C&D activities. Projects at the Wateree Recreation Area also have the potential to generate additional revenue for the 20 FW as additional services would be available for rent by military personnel. Therefore, the Proposed Action or Alternative 1 would result in beneficial impacts that would not be significant. For environmental justice, no adverse impacts have been identified. Therefore, no disproportionate impacts to minorities or low-income populations are anticipated. In addition, there would be no known environmental health or safety risks that would disproportionately affect children.

Cultural Resources. No significant impacts to cultural resources are expected as the projects are located in previously disturbed areas and are not sited in areas known to contain cultural

resources. Building 611 is the only site on Shaw AFB that is National Register of Historic Places (NRHP) eligible due to its Cold War significance. None of the projects in the Proposed Action or Alternative 1 would directly affect Building 611 or the building's eligibility for NRHP. An email to Shaw AFB's NEPA Coordinator dated January 14, 2010 from the South Carolina Department of Archives and History, a division of the State Historic Preservation Office (SHPO), concurred with the Finding of No Significant Impact (FONSI) (Appendix A). For all projects, compliance with Section 106 of the National Historic Preservation Act (NHPA), including SHPO consultation, would take place prior to C&D activities. If artifacts are discovered during construction activities, Shaw AFB's Cultural Resources Manager, Conservation Chief and NEPA Coordinator would be contacted immediately. All activities would stop until the site could be evaluated by a professional archaeologist as outlined in the 20 FW *Integrated Cultural Resources Management Plan*.

Biological Resources. No significant impacts to biological resources are expected as the projects are located in previously disturbed areas. Impacts would be limited to displacement of members of commonly occurring species. Neither the Proposed Action nor Alternative 1 would directly affect wetlands or aquatic communities. Best Management Practices (BMPs) including sediment control, construction and beneficial landscaping would be utilized. A letter from the United States Fish and Wildlife Service (USFWS) to Shaw AFB dated January 6, 2010 indicated no comments on the proposed projects. Threatened and endangered species and their critical habitat are not found in the project area. The closest threatened species is the Least Tern, a state threatened species, which is known to nest on the roof of the Base Exchange (BX). However, none of the projects in the Proposed Action or Alternative 1 would directly impact the BX or the least terns nesting habits.

Water Resources. Under the Proposed Action and Alternative 1, the projects would result in additional areas being developed and becoming impermeable to water. The additional impervious surface would increase stormwater runoff. Prior to the start of construction, preventive measures such as silt fences, storm drain inlet and outlet protection and other standard construction practices would be instituted in accordance with Shaw AFB's Stormwater Pollution Prevention Plan (SWPPP) to eliminate or reduce sediment and non-storm water discharges. For projects disturbing more than 1 acre, a South Carolina Pollutant Discharge Elimination System (SCPDES) Stormwater General Permit would be required. No changes to groundwater usage are anticipated as there would be no changes in personnel. The groundwater system is operating within capacity and has the capacity to meet any incidental or indirect change in demand. No construction or demolition activities would occur within wetlands or floodplains. Therefore, no significant impacts to water resources are anticipated.

Air Quality. Sumter County is in attainment for all criteria pollutants and no conformity analysis is required. Under the Proposed Action or Alternative 1, the C&D activities would not exceed the established 10 percent criterion for Sumter County's emissions for each individual pollutant basis. Therefore, no significant impacts to air quality are expected.

Hazardous Materials and Hazardous Waste. All hazardous materials and construction/demolition debris during the execution of the Proposed Action or Alternative 1 would be handled, stored and disposed of in accordance with federal, state and local regulations and laws. Hazardous waste may be generated as a result of the activities; however, storage and disposal of these wastes would be coordinated with the 20 FW Hazardous Waste Program Manager. In the event of fuel spillage during construction activities, the contractor would be responsible for the containment, clean up and related disposal costs. Prior to any construction or demolition, affected facilities would be inspected to identify all asbestos-containing materials (ACMs) and lead-based paints (LBP). In the event that these materials are discovered, all waste ACM and lead-containing materials would be disposed of in accordance with the South Carolina Department of Health and Environmental Control (SCDHEC) Rule 61-86.1, as well as related federal regulations. Some of the proposed projects directly overlie Environmental Restoration Program (ERP) sites; however, none of the components of the construction or demolition activities are expected to directly interact with the ERP sites or disturb any contaminated soil or groundwater. Prior to construction or demolition activities, the contractor would coordinate with the 20 FW ERP Manager to determine the necessary notices, waivers and permits are in place. Therefore, no significant impacts are expected from the implementation of the proposed projects in relation to hazardous materials and hazardous waste.

Safety. Short-term safety risks are associated with any demolition and construction activity; however adherence to standard safety practices would minimize any potential risks. All proposed facilities would be sited in accordance with applicable anti-terrorism/force protection (AT/FP) standards and regulations including UFC 04-010-01, *DoD Minimum Antiterrorism Standards for Buildings*. The demolition of two facilities in the CZ would slightly improve safety conditions on Shaw AFB by eliminating an airfield clearance issue. The construction of a visitors' center near the Main Gate within APZ I represents an incompatible land use. The center would be subject to an elevated potential for accidents. Two projects, construction of an Arm/De-Arm Pad and construction of two storage igloos, are proposed to be the site of storage, maintenance and handling of explosive material. Therefore, an explosive quantity-distance (Q-D) arc would be delineated for each structure depending on the type and amount of explosives to be stored or handled at each location. Under the Proposed Action, the proposed site for the Field Training Detachment Aircraft Maintenance Training Facility would be sited within an existing Q-D arc. A waiver to explosives safety policy may be required and/or the explosives safety risk could be reduced through reinforcement of the structure to be resistant to explosions. Overall, impacts to safety would be minor and not significant.

Noise. Under the Proposed Action and Alternative 1, C&D activities would result in a temporary increase in localized noise levels in the vicinity of the project areas. It is expected that construction would be limited to normal working hours between 7 a.m. and 5 p.m. Construction sound mufflers can also be used to reduce construction noise. Shaw AFB is an active military airfield such that all of the proposed projects would be subject to noise from aircraft operations and may require additional noise attenuation. Noise impacts resulting from C&D activities and the siting of the proposed facilities in high noise areas would be adverse, but not significant.

1.0 PURPOSE AND NEED

This environmental assessment (EA) has been prepared to analyze the potential environmental consequences associated with the Proposed Action, Alternative 1 and the No Action Alternative at Shaw Air Force Base (AFB) in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321 *et seq.*) and its implementing regulations.

Section 1.1 provides background information on Shaw AFB. The purpose and need for the Proposed Action are described in Section 1.2. A detailed description of the Proposed Action and alternatives is provided in Chapter 2.0. Chapter 3.0 describes the existing conditions of various environmental resources that could be affected by the Proposed Action and the alternatives. Effects of the Proposed Action and alternatives on resources are addressed in Chapter 4.0. Chapter 5.0 addresses potential cumulative effects of the Proposed Action and the alternatives, in conjunction with other recent-past, current and future actions that may be implemented in the region of influence (ROI).

Shaw AFB CIP EA

1.1 BACKGROUND

Shaw AFB is located in the east central part of South Carolina, approximately 30 miles east of the capital city of Columbia. The base is located within the city limits of Sumter and is 10 miles west of the city's center (Figure 1.1-1).

The city of Sumter is located in Sumter County, which is naturally bounded by the Wateree River to the west and the Lynches River to the east. The county includes a mixture of farmland, forested areas and wetlands, with the main population in and around the city of Sumter.

The 20th Fighter Wing (20 FW), the base host wing, operates the 55th, 77th and 79th Fighter Squadrons. Its primary mission is to provide, project and sustain combat-ready air forces. Headquarters (HQ) United States Air Forces Central Command (USAFCENT) is the major tenant at Shaw AFB. General goals of the base are to sustain the resources and relationships deemed appropriate to pursue national interests and provide for the command, control and communications necessary to execute the missions of the United States Air Force (Air Force), Air Combat Command (ACC), USAFCENT and the 20 FW.

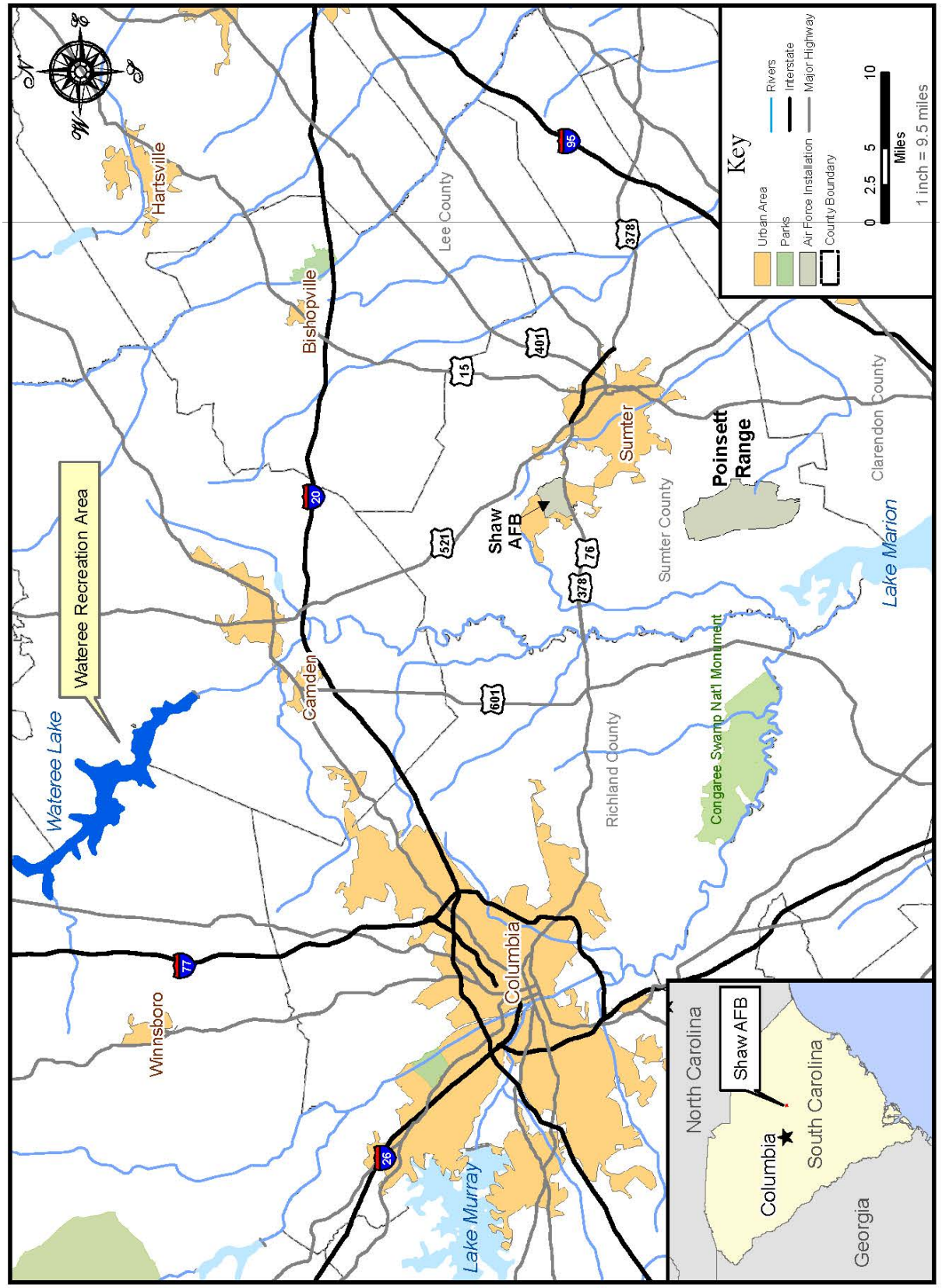

Figure 1.1-1. Shaw AFB Vicinity Map

In the 2005 Base Realignment and Closure (BRAC) decision, Shaw AFB was chosen as the site for the HQ United States Army Forces Central Command (USARCENT) mission. The HQ USARCENT mission is to serve as the Army component in a unified command—the United States Central Command—which has responsibility over a vast overseas area covering parts of Africa, Asia and the Persian Gulf. HQ USARCENT draws upon a reservoir of Army units and is responsible for planning, exercising and rapidly deploying these units in crisis situations.

Approximately 40 miles north of Shaw AFB in Kershaw County, South Carolina is Shaw AFB's Wateree Recreation Area. This area is a 26-acre recreation area on Lake Wateree that provides recreation to military personnel including recreational vehicle (RV) parking, cabins and boats for rent, fishing and swimming. Lake Wateree is currently owned by Duke Power and was created in 1920 when the Wateree River was dammed. Other areas around the lake include residential and vacation properties, as well as a 238-acre state park located on Desportes Island in Lake Wateree.

The 20 FW Capital Improvement Program (CIP) captures the Wing Commander's vision of those infrastructure and facility improvements which are necessary to support the mission. The goal of the CIP is to document the projects needed over the next 5 to 10 years. The CIP and the associated EA benefits Shaw AFB through:

- Coordinating land use planning, zoning and infrastructure project development;
- Expediting project execution through early planning;
- Streamlining the NEPA review process for defined infrastructure projects;
- Providing cost savings through a comprehensive NEPA analysis;
- Maintaining a current baseline for future analysis;
- Supporting tiering of environmental analysis and application of categorical exclusions;
- Meeting legal requirements and resource protection responsibilities; and
- Encouraging agency coordination on a suite of projects rather than individually.

1.2 PURPOSE AND NEED

The purpose of the EA is to evaluate the 20 FW CIP. The projects included in the CIP for Shaw AFB are needed to renovate or demolish outdated facilities that no longer adequately meet current mission requirements and construct new facilities to meet emerging or new mission requirements. Wherever possible, facilities are sited such that similar or compatible functions are collocated, thereby increasing efficiency and mission synergy. The CIP provides an opportunity to develop a base-wide development plan that will follow this and other planning principles. Table 1.2-1 identifies the proposed construction projects and provides a brief description of the need for each project.

This document performs the required environmental analysis of these projects, allowing for the implementation of the appropriate facility improvements as funds become available.

Table 1.2–1. Description of Proposed Construction Projects for the Shaw AFB Capital Improvement Program
(Page 1 of 3)

Project Number	*Project Title*	*Description/Need*
Demolition		
VLSB070097	Demolish Building 403 Heat Plant	The Heat Plant is obsolete and no longer in operation. Demolition would allow for future development of the area in the vicinity of the dormitories.
VLSB090027	Demolish Wastewater Treatment Plant (WWTP) Chlorine Chambers	The chlorine chamber is part of the previous treatment plant system which has been replaced by a new outfall and final effluent disinfection train. The chlorine chambers are no longer in use.
VLSB090055	Demolish or renovate Building 400 Airman Leadership School	The Airman Leadership School is located in a modified dormitory, Building 400, which has inadequate classroom space. The Airman Leadership School now utilizes classroom space available in the Education Center. The demolition of Building 400 would allow for future development in the vicinity of the dormitories or renovation would expand the useful life of the building for other functions.
VLSB023004	Demolish Base Engineer Facilities, Buildings 218, 1707 and 1708.	These buildings are outdated and inadequate for their functions. Buildings 1707 and 1708 are located in the Airfield Clear Zone (CZ) and present an airfield obstruction.
Expansion and New Construction		
VLSB993003	Expand Building 1109 Communications Facility	This building would be expanded to consolidate 20th Communication Squadron (20 CS) functions into one building.
VLSB073001	Construct United States Air Forces Central Command (USAFCENT) Operations Facility	USAFCENT operations require specialized equipment and, as a result, the facility would require specialized environmental controls to maintain temperature and humidity levels. A new facility would provide the necessary amenities.
VLSB043004	Construct Field Training Detachment Aircraft Maintenance Training Facility	A new facility would provide students with an adequate facility meeting United States Air Force (Air Force) standards.
VLSB090054	Construct Visitor's Center	Additional space is needed for a Visitor's Center in which personnel can receive base passes and identification cards created.
VLSB080066	Construct Fire Satellite Station	A fire station is needed in the northern portion of the base near the flightline to improve response times to the flightline and the residential areas of the base.

Table 1.2-1. Description of Proposed Construction Projects for the Shaw AFB Capital Improvement Program
(Page 2 of 3)

Project Number	*Project Title*	*Description/Need*
VLSB043002	Construct new Operations Group/Maintenance Group Facility	The new facility would consolidate functions from five other existing facilities.
VLSB053002	Expand Building 912, Chapel	The existing chapel has inadequate space to meet the requirements of base personnel.
VLSB113004	Construct Aircraft Maintenance Mobility Equipment/Storage Facility	An additional storage area is needed to provide interior storage for equipment currently stored outside.
VLSB103003	Construct or expand Munitions Storage Magazine (2 igloos)	New or expanded magazines are required to allow for expanded storage of munitions in accordance with Department of Defense Explosives Safety Board (DDESB) Explosive Safety Standards.
VLSB103004	Construct new Arm/De-arm pad	Arm De/Arm area is needed that would conform to DDESB Standards.
VLSB093013	Construct new gate on east side of base with necessary road improvements	A new gate on the east side of the base would support the new facilities being constructed under Base Realignment and Closure (BRAC).
VLSB090024b	Road realignment at Main Gate around Visitor's Center	The road realignment would allow for traffic to queue during peak times without backing onto US 76/378 and allow for improved ingress and egress to the base.
Construction and Related Demolition		
VLSB073002	Expand Headquarters (HQ) United States Air Forces Central Command (USAFCENT)	The expansion of the HQ USAFCENT would allow for the consolidation of mission functions into one facility.
VLSB093011	Construct New or Renovate Logistics Readiness Squadron Facility	The existing Logistics Readiness Squadron facility is outdated and inadequate for the mission. A new or renovated facility would provide a larger building increasing mission capability.
VLSB093001	Demolish Building 700 and construct new Radar Approach Control facility	The existing Radar Approach Control facility is outdated and inadequate. It is also located on the opposite side of the flightline from the new Control Tower.
VLSB043006	Demolish and replace with new construction or renovate Building 325 Vehicle Maintenance Facility	The existing facility is outdated and inadequate. The new or renovated facility would meet current and anticipated future needs of the 20th Fighter Wing (20 FW) vehicle maintenance function.
VLSB113003	Demolish Buildings 1517, 1501, 1211 and 1212 and construct new Armament Flight Maintenance and Storage Facility	The new facility would consolidate functions.
VLSB093010	Demolish Buildings 430 and 428 and replace with new Dormitory or renovate Buildings 430 and 428	The existing dormitories are outdated and no longer meet Air Force standards.

Table 1.2-1. Description of Proposed Construction Projects for the Shaw AFB Capital Improvement Program
(Page 3 of 3)

Project Number	*Project Title*	*Description/Need*
VLSB983005	Demolish six facilities and Construct 682nd Air Support Operations Squadron (ASOS) Complex.	The 682nd ASOS functions would be consolidated into one facility.
VLSB105001	Construct Vehicle Storage Yard	This vehicle storage yard would replace the storage yard that was demolished as part of the Base Realignment and Closure (BRAC) actions.
VLSB103002	Demolish Buildings 408 and 409 and construct new 144-person dormitory	The existing dormitories, Buildings 408 and 409, are outdated and no longer meet Air Force standards.
VLSB065001	Wateree Recreation Area Improvements including a new bath house and sewage storage	Improvements at the Wateree Recreation Area would expand the recreational capabilities of the area, provide additional recreational opportunities for base personnel and improve personnel morale.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This section describes the components of the CIP as well as preferred and potential alternative locations for the projects identified. This chapter presents the Proposed Action, Alternative 1 and the No Action Alternative.

2.1 METHODOLOGY FOR ALTERNATIVE IDENTIFICATION

When construction of a new facility is proposed at Shaw AFB, alternatives to new construction must be considered by the installation planning and programming staff. All available existing structures must be considered as potential locations for the function and these considerations must be documented on a DD Form 1391, *Military Construction Project Data.* In addition, the DD Form 1391 must justify the validity of the project and its importance to the 20 FW mission. The purpose and need for accomplishing each of the proposed CIP projects is presented in Chapter 1.0 of this document.

Once the need for a new facility has been validated, the base planning office completes a siting alternative analysis. The siting analysis takes into consideration several factors and criteria, some of which are briefly described below.

Exclusionary Criteria:

Operational Viability. The first criterion considered in siting facilities is operational viability. Sites that do not meet mission requirements are eliminated from further consideration.

Airfield Restrictions. To maintain safe operations, several restrictions are imposed. The Unified Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design,* limits locations and heights of objects and facilities in the immediate vicinity of an airfield, thereby minimizing hazards to airfield and flight operations. Objects or facilities not meeting these requirements require an approved waiver, a permissible deviation, or an exemption. Similar restrictions exist to minimize explosive or other safety risks.

Force Protection and Security Compliance. Facility location would meet the standards presented in UFC 4-010-0, *DoD Minimum Antiterrorism Standards for Building*.

Safety Zones. Department of Defense Explosives Safety Board (DDESB) 6055.9-STD and Air Force Manual (AFM) 91-201, *Explosives Safety Standards,* defined distance that need to be maintained between munitions storage areas and a variety of other types of facilities. These distances, called quantity-distance (Q-D) arcs, are determined by the type and quantity of explosive material to be stored. Each explosive material storage or handling facility has Q-D arcs extending outward from its sides and corners for a prescribed distance. Within these Q-D arcs, development is either restricted or prohibited altogether in order to ensure safety of

personnel and minimize potential for damage to other facilities in the event of an accident. Additionally, Accident Potential Zones (APZs) and Clear Zones (CZs) are established to delineate recommended surrounding land uses for the protection of people and property on the ground. APZs and CZs define the areas in the vicinity of an airfield that would have the highest potential to be affected if an aircraft mishap were to occur. Construction of facilities within the APZ or CZ require restrictions on the uses and heights of natural and manmade objects in the vicinity of air installations to provide for safety of flight and to ensure that people and facilities are not concentrated in areas susceptible to aircraft accidents.

Evaluation Criteria:

Compatibility with the Installation General Plan. The General Plan provides guidance on the overall layout of the base and identifies developmental opportunities and constraints. Projects were evaluated with respect to their compatibility with land use planning goals as laid out in the General Plan.

User Preference. The unit that would use the facility provides specific requirements or needs as the location of the facility or other siting requirements.

Space Availability. Many areas on the west side of the Shaw AFB flightline are heavily developed. Therefore, space is limited, making the availability of suitable and sufficient land an important criterion. In some cases, an existing structure would be demolished in order to allow for construction of the new structure which would be built under the Proposed Action or alternatives.

Infrastructure Availability. Costs and any other challenges associated with accessing the proposed facility location with utilities and other supporting infrastructure were considered.

Environmental Factors. Environmental factors considered as part of the alternative selection process included location of wetlands/floodplains and presence of Environmental Restoration Program (ERP) sites as described below. Alternatives were developed which minimized impacts to the environment.

Wetlands/Floodplains. Wetlands mapping has identified approximately 95 acres of wetlands on Shaw AFB located along Long Branch Creek in the northern portion of the base, as well as around the ponds located throughout the base. Executive Order (EO) 11990, *Protection of Wetlands*, indicates "that the proposed action include all practicable measures to minimize harm to wetlands." Floodplains are defined in EO 11988, *Floodplain Management*, as "the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, the area subject to a 1 percent or greater change of flooding in any given year" (that area inundated by a 100-year flood). EO 11988 requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. The only areas on Shaw AFB within a

floodplain are located along Long Branch Creek in the northern portion of the base. This floodplain is included in the airfield CZ, in which development is restricted due to airfield safety and clearance criteria.

ERP Sites. As a result of past resource and waste management practices at Shaw AFB, various toxic and/or hazardous compounds contaminated some areas of the base. In response, an environmental clean-up program, the ERP, was initiated and continuing efforts to comply with applicable laws and regulations ensure that present resource and waste management practices are performed in a manner that protects human health and the environment.

2.2 PROPOSED ACTION

The Proposed Action is to implement the projects as identified in the CIP. These projects are described in Table 2.2-1 and illustrated in Figure 2.2-1 and Figure 2.2-2. The map location column in Table 2.2-1 identifies the location of the project in Figure 2.2-1.

For facilities not previously surveyed for the presence of asbestos-containing materials (ACM), a survey would be completed prior to any demolition or renovation activities in accordance with the Shaw AFB Asbestos Management Plan (Air Force 2009a). Additionally, prior to demolition the contractor, in coordination with the 20th Civil Engineer Squadron (20 CES), would establish haul routes for the removal of materials from the site for each proposed project. The proposed demolition would involve complete dismantling and removal of all facility structures and equipment. To ensure proper handling and disposition of the waste, all actions would be completed in accordance with applicable regulatory requirements. All utilities would be capped or disconnected. To the greatest extent practicable demolition materials would be recycled. The demolition contractor would dispose of the remaining materials in an approved landfill in accordance with state and local regulations.

Prior to the start of building construction, each building site would be graded and sediment and erosion would be controlled by the use of standard construction practices. These practices would include the installation of a silt fence, storm drain inlet protection and rock/gravel filter berms within project limits as specified in the Shaw AFB SWPPP Section 4.4.1 prior to commencement of any on-site work.

Gravel would be placed at the entrance to construction sites to reduce the amount of soil tracked onto the paved roads. Similarly, fugitive dust would be controlled through standard construction practices. All construction operations would comply with the requirements of the South Carolina Stormwater Management and Sediment Reduction Act. Before beginning construction, the construction contractor would apply for and receive a permit from the South Carolina Department of Health and Environmental Control (SCDHEC) Bureau of Water. All areas disturbed by construction activities would be graded, seeded, fertilized and mulched upon completion of proposed construction activities.

Table 2.2–1. CIP Projects included in the Proposed Action
(Page 1 of 2)

Project Number	*Project Title*	*Area of Disturbance*[1]	*Map Location*
	Demolition		
VLSB023004	Demolish Base Engineer Facilities, Buildings 218, 1707 and 1708.	14,300 square feet (SF)	1
VLSB070097	Demolish Building 403 Heat Plant	4,640 SF	2
VLSB090055	Demolish Building 400 Airman Leadership School	27,904 SF	3
VLSB090027	Demolish Wastewater Treatment Plant Chlorine Chambers	1,586 SF	24
	Expansion and New Construction		
VLSB993003	Expand Building 1109 Communications Facility	33,154 SF	4
VLSB073001	Construct United States Air Forces Central Command (USAFCENT) Operations Facility	30,800 SF	5
VLSB043004	Construct Field Training Detachment Aircraft Maintenance Training Facility	39,600 SF	6
VLSB090054	Construct Visitor's Center	2,750 SF	7
VLSB080066	Construct Fire Satellite Station	16,500 SF	8
VLSB043002	Construct new Operations Group/Maintenance Group Facility	55,000 SF	9
VLSB053002	Expand Building 912, Chapel	11,000 SF	10
VLSB113004	Construct Aircraft Maintenance Mobility Equipment/Storage Facility	11,000 SF	11
VLSB103003	Munitions Storage Magazine (2 igloos)	6,244 SF	12
VLSB103004	Construct new Arm/De-arm pad	22,584 square yards (SY)	13
VLSB093013	Construct new gate on east side of base with necessary road improvements (2,300 linear feet with 2 24-foot wide lanes)	110,256 SF	14
VLSB090024b	Road realignment at Main Gate around Visitor's Center (1,500 linear feet with 2 24-foot wide lanes)	72,000 SF	15
VLSB105001	Construct Vehicle Storage Yard	9,625 SY	23
VLSB065001	Wateree Recreation Area Improvements including a new bath house, operations center and recreational vehicle (RV) parking.	3,194 SF	25 (Figure 2.2-2)

Table 2.2-1. CIP Projects included in the Proposed Action
(Page 2 of 2)

Project Number	*Project Title*	*Area of Disturbance*[1]	*Map Location*
Construction and Related Demolition			
VLSB073002	Expand Headquarters (HQ) United States Air Forces Central (USAFCENT) Building 1130 and Demolish Building 1128 and 1129	Demolition Area: 10,439 SF Construction Area: 55,000 SF	16
VLSB093011	Demolish Building 1604 Existing Logistics Readiness Squadron Facility and Construct New Logistics Readiness Squadron Facility	Demolition Area: 33,000 SF Construction Area: 47,630 SF	17
VLSB093001	Demolish Building 700 and construct new Radar Approach Control facility.	Demolition Area: 7,454 SF Construction Area: 10,780 SF	18
VLSB043006	Demolish and replace with new construction Building 325 Vehicle Maintenance Facility	Demolition Area: 42,141 SF Construction Area: 44,000 SF	19
VLSB113003	Demolish Buildings 1517, 1501, 1211 and 1212 and construct new Armament Flight Maintenance and Storage Facility	Demolition Area: 25,590 SF Construction Area: 27,500 SF	20
VLSB093010	Demolish Buildings 430 and 428 and replace with new Dormitory	Demolition Area: 49,327 SF Construction Area: 59,732 SF	21
VLSB983005	Demolish Buildings 1821, 1830, 1832, 1836, 1850, 1851, 1852, 1856 and Construct 682nd Air Support Operations Squadron (ASOS) Complex.	Demolition Area: 25,453 SF Construction Area: 49,500 SF	22
VLSB103002	Demolish Buildings 408 and 409 and construct new 144-person dormitory	Demolition Area: 55,807 SF Construction Area: 59,732 SF	26

Note: 1. Area of disturbance is calculated as the building footprint with an additional 10 percent area for staging of vehicles and equipment.

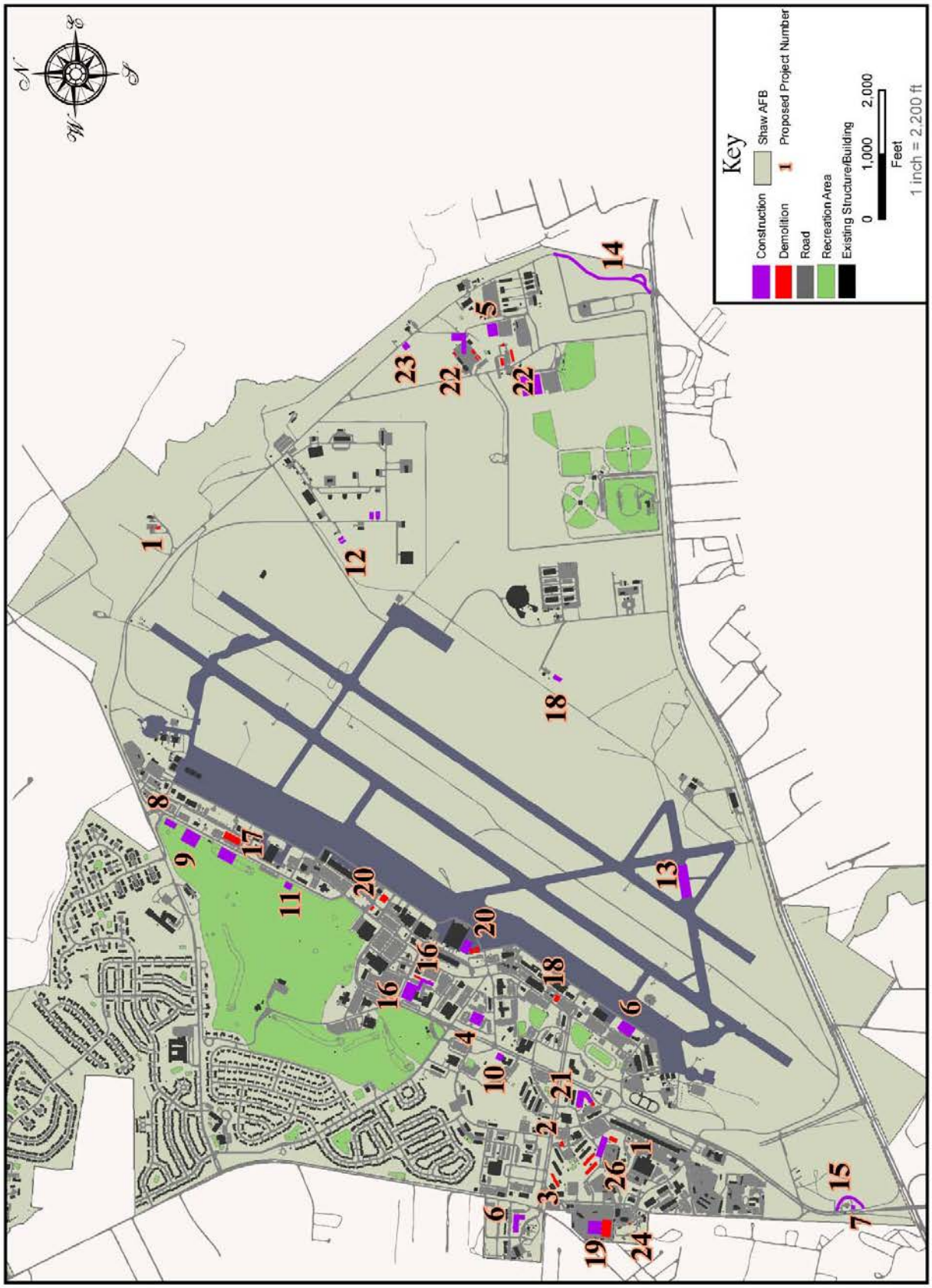

Figure 2.2-1. Project Locations of Proposed Action

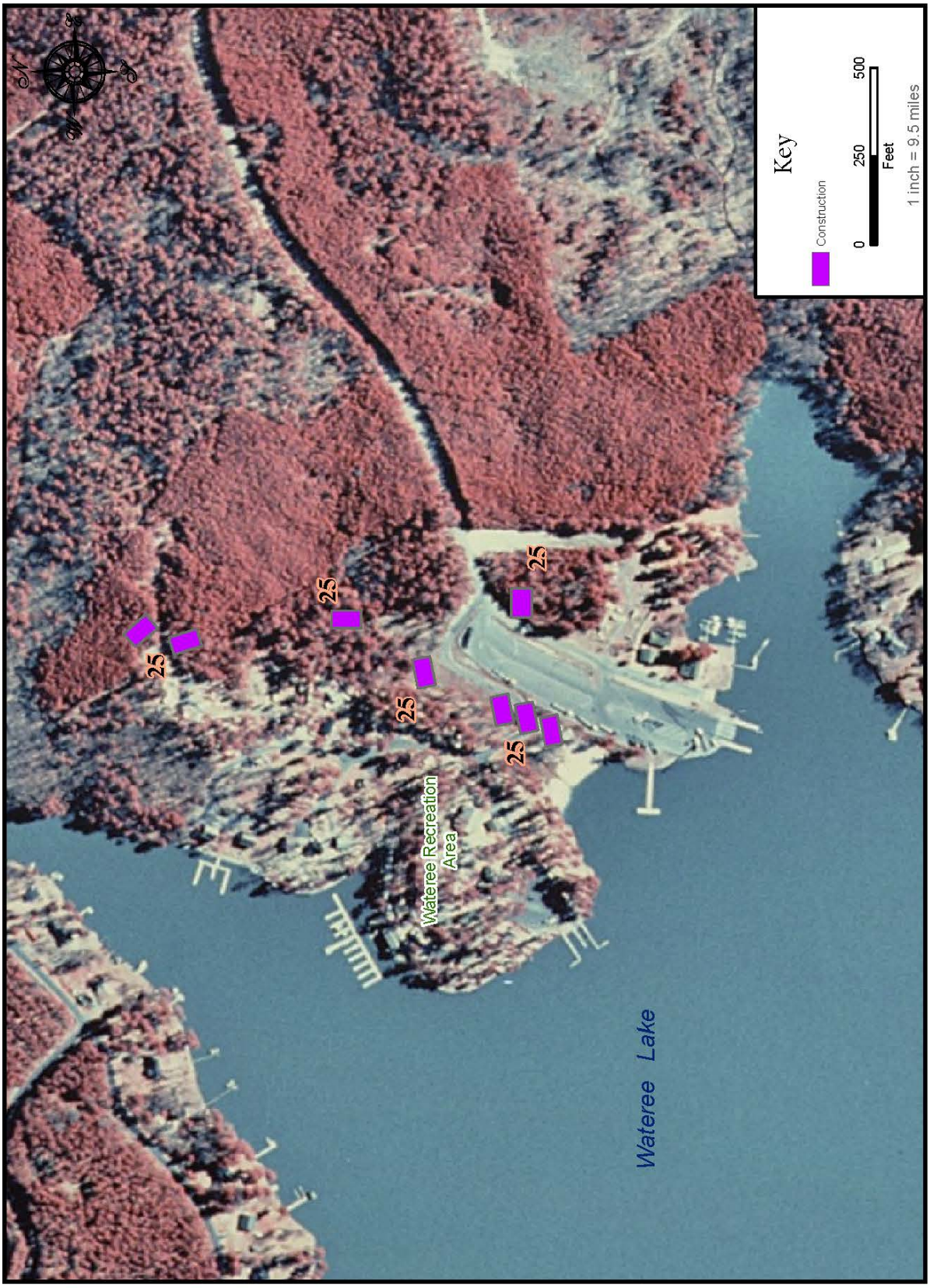

Figure 2.2-2. Project Locations of Proposed Action at Wateree Recreation Area

All new facilities would be constructed in accordance with the Air Force LEED program which encourages utilizing energy efficient and water conservation technologies in the construction. Connections to the existing water supply system would provide adequate domestic and fire protection water systems for each of the proposed projects. Wastewater generated by these facilities would be discharged to the existing sewer system and directed to the base wastewater treatment plant (WWTP). Stormwater would be directed through vegetated swales and storm sewers to the existing drainage system. Electric connections to the existing system are available in the immediate vicinity of each project area.

2.3 ALTERNATIVE 1

Viable action alternatives to the Proposed Action are listed below and were formulated based on the process described in Section 2.2. Following initial screening and siting analysis, viable alternatives to the Proposed Action were identified for 9 of the 26 proposed projects. For the remaining projects, only the Proposed Action and the No Action Alternative were found to meet the stated purpose, as described in Table 1.2-1 while also meeting the selection criteria in Section 2.1. Specific considerations and constraints for these projects are described in detail in Section 2.4, *Alternatives Considered but Not Carried Forward*. Table 2.3-1 includes all Alternative 1 projects. Projects listed in shaded text are the alternative projects that differ from the Proposed Action. The map location column in Table 2.3-1 identifies the marker for the project in Figure 2.3-1.

Table 2.3–1. CIP Projects Included in Alternative 1
(Page 1 of 2)

Project Number	*Project Title*	*Area of Disturbance*[1]	*Map Location*
Demolition			
VLSB023004	Demolish Base Engineer Facilities, Buildings 218, 1707 and 1708.	14,300 SF	1
VLSB070097	Demolish Building 403 Heat Plant	4,640 SF	2
VLSB090027	Demolish Wastewater Treatment Plant Chlorine Chambers	1,586 SF	24
Expansion, Renovation and New Construction			
VLSB090054	Renovate Airman Leadership School Building 400	27,904 SF	3
VLSB993003	Expand Building 1109 Communications Facility	33,154 SF	4
VLSB073001	Construct United States Air Forces Central Command (USAFCENT) Operations Facility	30,800 SF	5
VLSB043004	Demolish and Construct Building 1029 Field Training Detachment Aircraft Maintenance Training Facility at current location off the Main Base	39,600 SF	6
VLSB080066	Construct Fire Satellite Station	16,500 SF	8
VLSB043002	Construct new Operations Group/Maintenance Group Facility	55,000 SF	9
VLSB053002	Expand Building 912, Chapel	11,000 SF	10

Table 2.3-1. CIP Projects Included in Alternative 1
(Page 2 of 2)

Project Number	*Project Title*	*Area of Disturbance*[1]	*Map Location*
Demolition			
VLSB103003	Expand Existing Munitions Storage Magazine (2 igloos)	6,244 SF	12
VLSB103004	Construct new Arm/De-arm pad	22,584 SY	13
VLSB093013	Construct new gate on east side of base with necessary road improvements (2,297 linear feet with 2 24-foot wide lanes)	110,256 SF	14
VLSB090024b	Road realignment at Main Gate around Visitor's Center (1,500 linear feet with 2 24-foot wide lanes)	72,000 SF	15
Project Number	*Project Title*	*Area of Disturbance*[1]	*Map Location*
VLSB073002	Expand Headquarters (HQ) United States Air Forces Central (USAFCENT) Building 1130 to northeast	55,000 SF	16
VLSB093011	Renovate Existing Logistics Readiness Squadron Facility Building 1604	33,000 SF	17
VLSB043006	Renovate Building 325 Vehicle Maintenance Facility	42,141 SF	19
VLSB093010	Renovate Buildings 430 and 428	49,327 SF	21
VLSB105001	Construct Vehicle Storage Yard near existing vehicle storage yard	9,625 SY	23
VLSB103002	Renovate Buildings 408 and 409	55,807 SF	26
VLSB065001	Wateree Recreation Area Improvements including a new bath house, operations center and recreational vehicle (RV) parking.	3,194 SF	Figure 2.1-2
Construction and Related Demolition			
VLSB093001	Demolish Building 700 and construct new Radar Approach Control facility.	Demolition Area: 7,454 SF Construction Area: 10,780 SF	18
VLSB113003	Demolish Buildings 1517, 1501, 1211 and 1212 and construct new Armament Flight Maintenance and Storage Facility	Demolition Area: 25,590 SF Construction Area: 27,500 SF	20
VLSB983005	Demolish Buildings 1821, 1830, 1832, 1836, 1850, 1851, 1852, 1856 and Construct 682nd Air Support Operations Squadron (ASOS) Complex.	Demolition Area: 25,453 SF Construction Area: 49,500 SF	22

Notes: 1. Area of disturbance is calculated as the building footprint with an additional 10 percent area for staging of vehicles and equipment.

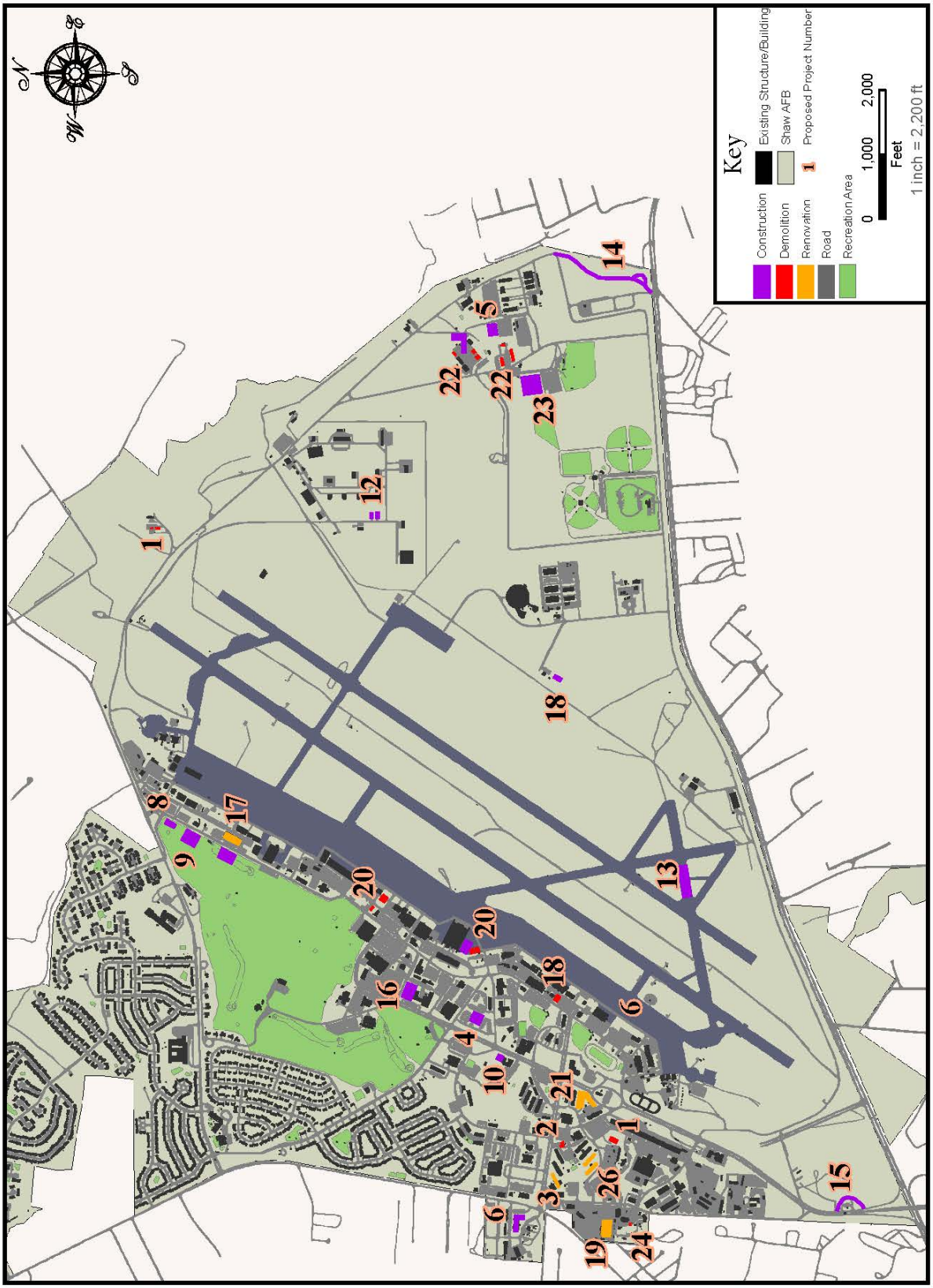

Figure 2.3-1. Project Locations of Alternative 1 at Shaw AFB

2.4 NO ACTION ALTERNATIVE

Section 1502.14(d) of NEPA requires an EA to include a No Action Alternative. Under the No Action Alternative for this EA, the projects identified in the CIP would not be implemented. The 20 FW would continue to utilize outdated or inadequate facilities and similar or compatible mission functions would not be consolidated. Analysis of the No Action Alternative provides a benchmark against which decision-makers can compare the magnitude of the environmental effects of the proposed action.

2.5 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

In addition to the Proposed Action, Alternative 1 and the No Action Alternative discussed above, other project alternatives were evaluated and eliminated from further consideration. These project alternatives are discussed below.

- ***Re-use of Building 403, Heat Plant:*** This facility is specially designed to house a steam heat plant that once provided heat for up to 22 buildings. The heat plant is no longer in operation and is incompatible with surrounding land uses. The design of the facility is specific to its prior function and therefore is not suitable for re-use.
- ***Re-use of the Wastewater Treatment Plant Chlorine Chamber:*** The chlorine chambers for this wastewater treatment plant are no longer required for the operation of the wastewater treatment plant following an upgrade and the installation of a new sewer outfall. The chlorine chambers have been deactivated and are no longer used in the treatment process. Since the chambers were designed for a specific function that is no longer used, there is no practicable re-use for them.
- ***Renovation and Re-use of Base Engineer Facilities, Buildings 218, 1707 and 1708:*** Due to its age and inadequate features, Building 218 is underutilized. The demolition of Building 218 would clear land for future development. Buildings 1707 and 1708 are both located at the end of the runway within the CZ. These facilities do not comply with the Air Force CZ and Accident Potential Guidelines contained in UFC 3-260.
- ***Construct a new base chapel:*** The existing chapel (Building 912) is undersized to meet the demands of base personnel. However, the additional space needed by the chapel is below the threshold set by Air Force policy that would justify replacement construction. The existing chapel is located in close proximity to dormitories, base housing and other residential services providing convenient access to on-base personnel. The area is also heavily developed and the undeveloped space required to construct a new chapel while still providing a similar location for access from dormitories and base housing is not available.
- ***Construct a new Arm/De-Arm pad at a different location on the flightline:*** In accordance with the requirements contained in UFC 3-260, Air Force arm/de-arm pads should be located adjacent to runway thresholds and sited such that armed aircraft are oriented in the direction of least populated areas or towards revetments. Additional requirements for siting are also contained in Section 6.10 of UFC 3-260.

- ***Locate the Radar Approach Control at an alternative site:*** The Radar Approach Control facility should be collocated with the air traffic control tower for flight safety and mission synergy and comply with the requirements contained in UFC 3-260. The Radar Approach Control would utilize the same infrastructure as the air traffic control tower.
- ***Re-opening the Polifka Gate:*** The Polifka Gate was closed as a result of the need for additional Anti-terrorism/Force Protection (AT/FP) measures implemented after September 11, 2001. Re-opening the Polifka Gate would not sufficiently alleviate traffic congestion at the Main Gate or the east side of the base due to its present location.
- ***Construct new Communications Facility:*** The expansion of Building 1109 Communications Facility is intended to consolidate existing communications functions within one facility while maintaining the existing connections to the adjacent Data Processing Center. Therefore, a new facility constructed in a different location would not be able to utilize the existing infrastructure.
- ***Alternative site for new United States Air Forces Central Command (USAFCENT) Operations Facility:*** The proposed USAFCENT Operations Facility was sited to be adjacent to the existing USAFCENT operations on the east side of the base. Additional sites were evaluated during initial screening; however, all of the sites were within 1,000 feet of the proposed site due to the need to consolidate similar mission functions.
- ***Alternative site for new Fire Satellite Station:*** Alternative sites were evaluated during initial screening for the Fire Satellite Station. However, the alternative sites considered could not meet required response times of fire equipment to locations on the east side of the base or within the military family housing (MFH) areas.
- ***Alternative site for new Operations Group/Maintenance Group facility:*** An alternative site for the Operations Group/Maintenance Group Facility was considered at the current location of Building 1604 (proposed to be demolished). However, the site would have been too small to accommodate the proposed Operations Group/Maintenance Group facility while maintaining appropriate AT/FP standoff distances. Therefore, the site included in the Proposed Action is the most viable location.
- ***Alternative site for new Aircraft Maintenance Mobility Equipment/Storage facility:*** An alternate site was considered for the Aircraft Maintenance Mobility Equipment/Storage Facility at the corner of Sweeney Boulevard and Dogwood. However, this site was determined to be the most viable site for the Fire Satellite Station due to adequate response times. Therefore, the site included in the Proposed Action is the only viable site that meets mission requirements.
- ***Alternative site for Wateree Recreation Area improvements:*** Alternatives for the projects in the Wateree Recreation Area were considered; however, alternatives were not identified that preserved the natural environment of the recreation area as well as provide additional services to the area. Therefore, the only viable alternatives for the Wateree Recreation Area are the Proposed Action and the No Action Alternative.
- ***Renovation of Buildings 1517, 1501, 1211 and 1212:*** Renovation of these structures was considered; however, the buildings are outdated and do not conform to requirements provided in Air Force Handbook 32-1084, *Facility Requirement Handbook*.

- ***Renovation of Buildings 1821, 1830, 1832, 1836, 1850, 1851, 1852 and 1856:*** Renovating these structures was considered. However, these facilities were originally designed to be temporary facilities when they were first constructed over 20 years ago. These facilities are now outdated and do not conform to requirements in AFH 32-1084.

2.6 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

Congress enacted NEPA (42 USC 4321 *et seq.*, as amended) to establish a national policy for the protection of the environment. Specifically, the regulation requires federal agencies to assess the environmental consequences of a proposed action and alternatives systematically as part of the decision-making process. The intent of NEPA is to protect, restore, or enhance the environment through well informed decisions by the decision-maker. The President established the Council on Environmental Quality (CEQ) under NEPA to implement the provisions of the Act and review and appraise federal programs and activities in light of NEPA policy. The CEQ promulgated regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] 1500–1508). This EA has been prepared by the Air Force, ACC in accordance with the requirements of NEPA of 1969, the CEQ regulations implementing NEPA and 32 CFR Part 989.

2.6.1 Environmental Assessment Process

Compliance with NEPA guidance for preparation of an EA involves several steps, depicted in Figure 2.6-1. The environmental analysis process includes public and agency review of information pertinent to the proposed action and alternatives and provides a full and fair discussion of potential consequences to the natural and human environment. Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) letters were sent; see Appendix A for responses received through November 16, 2009.

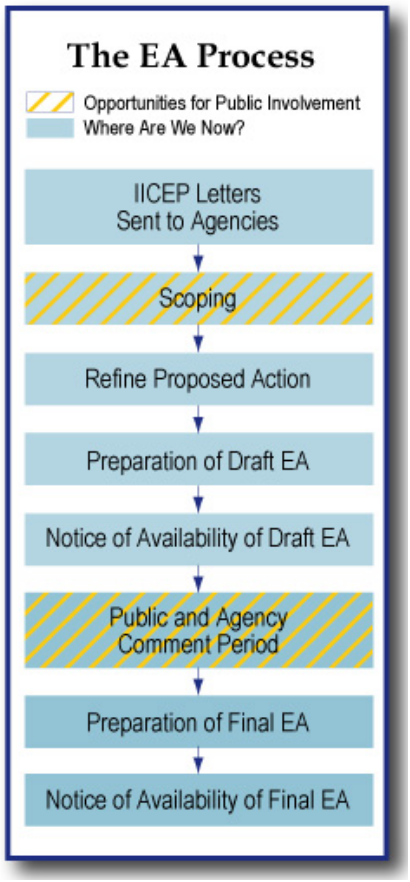

Figure 2.6-1. EA Process

The Environmental Impact Analysis Process includes the review of all information pertinent to the proposed action and alternatives and provides a full and fair discussion of potential consequences to the natural and human environment. The process includes involvement with the public and agencies to identify possible consequences of an action, as well as the focusing of analysis on environmental resources potentially affected by the proposed action or alternatives.

2.6.2 Scope of Resource Analysis

The Proposed Action and Alternative 1 have the potential to affect certain environmental resources. These potentially affected resources have been identified through communications

with state and federal agencies and review of past environmental documentation. Specific environmental resources with the potential for environmental consequences include land use, infrastructure, socioeconomics and environmental justice, cultural resources, biological resources, water resources, air quality, hazardous materials and hazardous waste, safety and noise.

2.6.3 Public and Agency Involvement

In October 2009, the Air Force contacted local, state, tribal and federal agencies to inform them of the Air Force's intent to prepare an EA for the Proposed Action at Shaw AFB (refer to Appendix A). Through the IICEP process, the Air Force obtained information regarding pertinent environmental issues which the agencies indicated should be addressed in the environmental impact analysis. Agencies associated with the management of cultural and biological resources, primarily for compliance with the Endangered Species Act (ESA) and National Historic Preservation Act (NHPA), were notified of the intent to prepare an EA. In addition, community leaders and legislative representatives from potentially affected communities in South Carolina were contacted. Their responses are included in Appendix A.

To facilitate public involvement, the Air Force prepared and published a newspaper announcement in *The Item* on December 15, 2009 announcing the availability of the Draft EA for public and agency review. Further, hard copies of the Draft EA were provided to agencies contacted during the IICEP process. A hard copy was also available in the Sumter County Library for public access. No comments were received from the public during the 30-day review period. Agency comment letters are included in Appendix A.

REGULATORY COMPLIANCE AND PERMIT REQUIREMENTS

This EA has been prepared to satisfy the requirements of NEPA (Public Law [PL] 91-190, 42 USC 4321, *et seq.*) as amended in 1975 by PL 94-52 and PL 94-83. The intent of NEPA is to promote well-informed federal decision-making. In addition, this document was prepared in accordance with the requirements of the CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR § 1500–1508) and 32 CFR Part 989, *et seq.*, *Environmental Impact Analysis Process* (formerly promulgated as AFI 32-7061).

Implementation of the Proposed Action would require concurrence from several regulatory agencies. Compliance with the ESA involves communication with the Department of the Interior (delegated to the United States Fish and Wildlife Service [USFWS]) in cases where a federal action could affect the listed, threatened, or endangered species, species proposed for listing, or species that could be candidates for listing. A letter was sent to the appropriate USFWS agencies as well as their state counterparts, informing them of the Proposed Action and alternatives and requesting data regarding applicable protected species.

The preservation of cultural resources falls under the purview of the State Historic Preservation Office (SHPO), as mandated by the NHPA and its implementing regulations. A letter was sent to the South Carolina SHPO and the Catawba Tribe informing them of the Proposed Action and

alternatives. Other regulatory or permit requirements include a stormwater National Pollutant Discharge Elimination System (NPDES) Permit issued by the SCDHEC. Additionally, prior to construction of projects interacting with ERP site SS-35, Shaw AFB would file a Reporting Planned Changes document with the SCDHEC in accordance with Permit Condition I.E.10 of the Shaw AFB Hazardous Waste Management Permit. Appendix A includes copies of relevant coordination letters sent by the Air Force.

2.7 COMPARISON OF ALTERNATIVES

Table 2.7-1 summarizes the potential environmental impacts of the Proposed Action and alternatives, based on the detailed impact analyses presented in Chapter 4.0.

Table 2.7–1. Summary of Potential Environmental Consequences

Resources	*Proposed Action*	*Alternative 1*	*No Action Alternative*
Land Use Resources	+	+	0
Land Use	+	+	0
Recreation	+	+	0
Visual Resources	0	0	0
Transportation	+	+	0
Infrastructure	-	-	0
Socioeconomics/Environmental Justice	+	+	0
Cultural Resources	0	0	0
Biological Resources	-	-	0
Water Resources	-	-	0
Air Quality	-	-	0
Hazardous Materials and Waste Management	-	-	0
Safety	-	-	0
Noise	-	-	0

Notes: " – " indicates an adverse but not significant impact; " + " indicates a positive/beneficial impact; and " 0 " indicates no change.

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3.0 AFFECTED ENVIRONMENT

This section defines the environmental resources which could be impacted by implementation of the Proposed Action or Alternative 1. The environmental resources analyzed in this EA are: land use, infrastructure, socioeconomics and environmental justice, cultural resources, biological resources, water resources, air quality, hazardous materials and hazardous waste, safety and noise. This section also describes the area, or ROI, in which potential environmental consequences resulting from the proposed action could occur.

RESOURCES ELIMINATED FROM DETAILED CONSIDERATION

Two resources were not evaluated in this EA because it was determined during the scoping process that implementation of the Proposed Action, Alternative 1 and the No Action Alternative is unlikely to affect them. A brief explanation of the reasons why these resources have been eliminated from further consideration in this EA is provided below.

Airspace. The Proposed Action, Alternative 1 and the No Action Alternative do not involve aircraft, air traffic control, or airspace modifications.

Liquid Fuels (an infrastructure element). The Proposed Action, Alternative 1 and the No Action Alternative do not involve aircraft, JP-8 or other fuel supplies or consumption by the 20 FW.

3.1 LAND USE RESOURCES

3.1.1 Definition of the Resource

The attributes of land use addressed in this analysis include land use, visual resources, transportation and recreation. Analysis of land use resources focuses on general land use patterns (including recreational areas), ownership, management plans, policies, ordinances and regulations. These provisions determine the types of uses that are compatible and identify appropriate design and development standards to address designated or environmentally sensitive areas. Visual resources include the natural and manufactured features that constitute the aesthetic qualities of an area. Transportation includes the road networks providing access between the local community and the base as well as within the base. Recreation considers recreational opportunities on and near Shaw AFB. The ROI for land use, visual resources, transportation and recreation includes Shaw AFB, the Wateree Recreation Area and the off-base road network providing direct access to Shaw AFB.

3.1.2 Existing Conditions

LAND USE

The main cantonment area at Shaw AFB encompasses 3,416 acres and is located within the city limits of Sumter, approximately 10 miles west of the city center, as depicted on Figure 1.1-1.

The 20 FW groups land uses by function in geographic areas. Most of the developed land uses occur north and west of the airfield. Support services and the runway are centrally located and on-base MFH areas are located in the northwest portion of the base. Open space and light development, including a munitions storage area and outdoor recreational facilities, are located in the eastern portion of the base.

Several adopted plans and programs guide land use planning at Shaw AFB. Base plans and studies present factors affecting both on- and off-base land use and include recommendations to assist on-base officials and local community leaders in ensuring compatible development.

The *Shaw AFB General Plan* (Air Force 2009b) provides an overall perspective on development opportunities and constraints as well as a framework for making effective programming, design, construction and resource management decisions. The *Integrated Natural Resources Management Plan FY 2007-2011* (Air Force 2007a) is used to coordinate natural resources management by the 20 FW and is a component plan to the General Plan.

The *Air Installation Compatible Use Zone (AICUZ) Study* (Air Force 1994) for Shaw AFB recommends compatible land development patterns in the off-base areas subject to aircraft noise and accident potential. Sumter County, in conjunction with the 20 FW, prepared a *Joint Compatible Land Use Study (JCLUS)* that incorporates AICUZ recommendations. The JCLUS also describes existing land uses; identifies encroachment areas around the base; recommends modifications to the county zoning ordinance; addresses long-range infrastructure improvements; and describes 20-year growth trends for the area (Robert and Company 1994).

Zoning around the base includes heavy industrial and limited commercial. Varying degrees of residential densities are permitted around the base perimeter. On the major roads, including United States (U.S.) Highways 76/378 and 521 and State Highway 441, general commercial businesses are permitted and commercial development occurs.

Land uses within Sumter County include agriculture and forestry, with approximately 58 percent of the county classified as prime farmland or farmlands of statewide importance (Air Force 2007a). Special-use areas in the vicinity of the base include Poinsett State Park, a portion of Woods Bay State Park, the Manchester State Forest (including a Wildlife Management Area), Lee State Park and a portion of Lake Marion impoundment, comprising over 110,000 acres.

The Wateree Recreation Area is located approximately 40 miles north of Shaw AFB on the shores of Lake Wateree in Kershaw County. The Shaw AFB recreation area encompasses approximately 24 acres. The lake has approximately 216 miles of shoreline and is surrounded by three counties: Kershaw, Fairfield and Lancaster. The lake was created in 1920 when the Wateree River was dammed and the current owner of the lake is Duke Power. Lake Wateree State Park is a 238-acre state park located on the Desportes Island in Lake Wateree. Other areas surrounding the lake include residential properties, vacation properties and other recreational sites such as camping.

VISUAL RESOURCES

Shaw AFB is located on the edge of the city of Sumter and approximately 30 miles east of the capital city of Columbia. The areas on the northwest portion of the base are primarily MFH. The flightline bisects the base northeast to southwest through the middle of the installation. Land situated on the southeast side of the installation is predominantly planted pine forest, along with the munitions storage facilities (and recreational facilities). Approximately 9 percent of the land within the base boundary is open space (Air Force 2009b). These areas include pine plantations adjacent to the airfield, a creek along the north edge of the base and four ponds, including the constructed ponds on the golf course.

Sumter County is characterized by a mixture of large tracts of agricultural land interspersed with low-density residential development and homesteads. Commercial strip development occurs along U.S. Highway 76/378. With a long history of pine plantations, the landscape is broken up with tracts of pine trees of varying age and height. The area is generally flat to gently sloping, with steeper slopes located near streams and drainage areas. Surface elevation ranges from 200 to 330 feet above sea level (Air Force 2009b).

TRANSPORTATION

Vehicles access Shaw AFB through four active security checkpoints: the Southwest (Main) Gate on Shaw Drive, the Northwest Gate on Frierson Road, the Southeast (Commercial) Gate on U.S. Highway 76/378 and the Northeast Gate on Frierson Road (Air Force 2007b). The on-base streets are classified as arterials, collectors, or local streets. The arterials, those streets that carry the majority of traffic, are Polifka Drive, Rhodes Avenue and Shaw Drive. Six collectors (Condor Country Road, Killian Avenue, Lance Avenue, Patrol Road, Stuart Street and Sweeney Street) distribute traffic from the arterials to the local streets or directly to intended destinations. The major arterial highway in the area is U.S. Highway 76/378, which borders Shaw AFB on the south and provides access to the Interstate Highway system (Air Force 2004a).

The 20 FW completed a traffic study (Air Force 2007b) in 2006 to analyze existing and anticipated future traffic conditions. The study focused on peak-hour intersection counts at the four gates (Southwest–Main, Northwest, Northeast and Southeast-Commercial) and two intersections on Shaw Drive (Polifka Drive and Rhodes Avenue). The study also looked at the level of service (LOS), which is a quantitative measure of the level of congestion or delay at an intersection. LOS is indicated on a scale from "A" to "F." LOS A indicates very little congestion or delay. LOS F indicates a high level of congestion or delay. The study identified several traffic movements that had existing unsatisfactory LOS of E or F. These locations included Shaw Drive/Aiken Street, Shaw Drive and Polifka Drive, Frierson Road and State Highway 441 and U.S. Highway 76/378 at the Southeast Gate. The study also noted the long queues experienced by inbound traffic at the Southwest (Main) Gate and the Northwest Gate off State Highway 441.

The study also projected traffic at various gates and intersections based on proposed land use changes at Shaw AFB. These changes would lead to an estimated increase in morning peak hour volumes of 23 percent and afternoon peak hour increases of 18 percent. Given these increases, recommendations for immediate improvements were identified for the Southwest (Main) Gate and the Northwest Gate and for the intersections of Shaw Drive with Polifka Drive and Aiken Street. The study also identified future improvements for the Northwest and Southeast (Commercial) Gates.

In 2009, the 20 FW completed another traffic study including the proposed relocation of the 3rd Army/Army Central Command (ARCENT) unit to Shaw AFB (Air Force 2009c). This study analyzed the traffic patterns and volumes at the Main Gate and the Southeast-Commercial Gate and how they would change with the beddown of the ARCENT unit. This traffic study states that over 50 percent of the traffic entering or exiting the base use the Main Gate while the remaining traffic is evenly divided between the Northwest Gate and the Frierson Road Gate. No entry through the commercial gate was recorded. During peak hours, the intersection of Sweeney Street and Patrol Road operate at an acceptable LOS ranging from LOS A to C depending on the direction of traffic. The intersection of the commercial gate and U.S. Highway 76/378 is rated LOS F, particularly during evening peak hours on the southbound lanes. Shaw Drive at the intersection of Patrol Road and Chapin Street is also rated LOS F during peak hours in both directions.

A 5-mile rail spur is used to move petroleum, oil and lubricant (POL) tank cars from the CSX railroad siding to the POL off-load area (Air Force 2004a). This rail line crosses U.S. Highway 76/378 and enters the installation just east of the Main Gate.

RECREATION

The Carolina Lakes Golf Course is an 18-hole golf course located on the west side of Shaw AFB. The terrain of the course is mostly flat with several water hazards and sand bunkers. Other recreational opportunities on Shaw AFB include two pools, a skeet range, bowling alley and theater. The Fitness and Sports Center offers racquetball courts, tennis courts, basketball and volleyball courts, a quarter-mile running track, a lighted soccer/football field and several lighted softball fields, in addition to aerobics and free weights. The Falcons Nest Fam Camp also offers RV parking sites with full hookups.

The Wateree Recreation Area is located on the shore of Lake Wateree. Lake Wateree is a 13,250-acre lake constructed by a dam on the Wateree River. The lake is currently managed by Duke Power and is also used to generate power. The Wateree Recreation Area provides cabins, RV parking and primitive camping for military personnel, retirees and Department of Defense (DoD) civilians to rent. The recreation area also provides fishing, swimming and water sports, as well as boats for rent.

3.2 INFRASTRUCTURE

3.2.1 Definition of the Resource

The infrastructure assets at Shaw AFB include electrical and natural gas, potable water, wastewater, solid waste, communications system and storm drainage system. The ROI for the infrastructure resource is Shaw AFB and the capacity of the infrastructure systems immediately adjacent to the base to provide necessary services.

3.2.2 Existing Conditions

ELECTRICAL DISTRIBUTION AND NATURAL GAS SYSTEMS

The 20 FW purchases power from Progress Energy and the Black River Electric Cooperative (BREC). Progress Energy provides electricity to the main cantonment area and the majority of the MFH area, whereas BREC supports the remaining housing and southeastern portion of the base. The total capacity of the electrical system is 27.6 megawatts and Fiscal Year (FY) 2007 usage was approximately 61 percent at peak periods.

Natural gas is supplied to Shaw AFB by South Carolina Pipeline via a 4-inch pipeline entering the base at the junction of Frierson Road and Sweeney Street. A metering station divides the supply between MFH areas and industrial facilities. The capacity of the system is 150,000 cubic feet/day and it is 21.5 percent utilized.

POTABLE WATER

The 20 FW produces all of its own water from five on-base wells, which withdraw from the Black Creek Aquifer and the Middendorf Aquifer. Wells completed in this aquifer are capable of yielding up to 750 gallons per minute (gpm). The main base is served by Wells 3 and 5 and the Wherry system (housing) is served by Wells 4, 6 and 7. Well 1 is inoperable and will be redrilled in a new location near the southwest corner of the base, while Well 2 has been abandoned (personal communication, Hallmark 2009). The functional wells have the capacity to provide 2.1 million gallons per day (mgd), based on a 16-hour pumping day. Average daily production is 0.75 mgd with a daily maximum reported at 1.1 mgd. Water is treated with chlorine, fluoride and calcium at each well site prior to storage in one of three aboveground storage tanks (ASTs). The total storage capacity for potable water is 900,000 gallons. Additionally, there are two ground-level storage tanks that provide 1,000,000 gallons of non-potable water to support the fire protection system. Between FY 2004 and FY 2008 water usage ranged from approximately 0.73 mgd (269 million gallons per year) to approximately 0.84 mgd (309 million gallons per year) (Air Force 2009b). The 20 FW also maintains two interconnections with the High Hills Rural Water Company and one interconnection with the City of Sumter Water System. These interconnections are rarely used and are intended for emergencies (HQ ACC 2006; Air Force 2004a, 2004b).

As a result of a heavy aquifer use, there is indication that a cone of depression has developed in the groundwater in the vicinity of Shaw AFB. In response, Shaw AFB implemented water conservation measures and will continue to evaluate the drinking water supply system as future base development occurs (Air Force 2009b).

WASTEWATER

Domestic and industrial wastewater generated at Shaw AFB is treated at an on-base WWTP. Treated effluent is discharged into the Wateree River and sludge is hauled off-base for disposal (Air Force 2009b). Five lift stations move the wastewater from the main cantonment and housing areas to the WWTP where preliminary, secondary and tertiary treatment processes are performed. Effluent from the treatment plant is disinfected and discharged from the facility after metering and sampling at outfall 001; from there it is directed off-base through a 6-mile long pipeline to the Wateree River under NPDES Permit # SC0024970. The permit capacity of the WWTP is 1.2 mgd with an average daily flow of 0.8 mgd. The WWTP's capacity is generally exceeded twice a year when inflow/infiltration into the wastewater conveyance system occurs as a result of periods of heavy rainfall (Air Force 2009b).

SOLID WASTE

The 20 FW has a Solid Waste Management Plan to guide and direct the management of solid wastes generated on base. Solid wastes on the installation are either transported to an off-base landfill or recycled. In 2003, 8,230 tons of solid waste was generated at Shaw AFB, of which 2,457 tons were recycled and the remaining 5,773 tons were transported to a landfill. In the same year, Shaw AFB generated 1,459 tons of construction and demolition (C&D) waste and recycled 1,371 tons (Air Force 2005a). Non-recyclable waste is taken to the Sumter County landfill transfer point and then transported to either the Lee County municipal solid waste landfill in Bishopville or the Richland County landfill. C&D materials that are not recycled are disposed in the Sumter County C&D landfill. The Sumter County landfill is currently projected to reach capacity within 20 years. The Lee County landfill is projected to reach capacity in 15 years and the Richland County landfill is projected to reach capacity in 6 years (SCDHEC 2007). From July 2005 through June 2006, approximately 3,088 tons of solid waste was disposed of into an off-base landfill (personal communication, Johnson 2006).

The base recycling and reuse program significantly reduces the amount of solid waste that is transported to a landfill. The 20 FW has a 2-year recycling contract with Atlantic Coast Containers. The on-base recycling service is basically composed of two parts: MFH and the Industrial sector. Residents in MFH use 8-gallon totes to collect all of the commodities. This "mixed collection" container is then left at the curb on the prescribed pick-up day. The Industrial sector collects only mixed paper and cardboard in 6- to 9-cubic-yard containers placed around the base. Base personnel take the remaining commodities to the on-base Recycling Center by privately-owned vehicles or government-owned vehicles. Recyclables are stored in the 6- to 8-cubic-yard containers at the Recycling Center before going off-base. Items such as waste tires and lead acid batteries are turned into the Defense Reutilization and

Marketing Office for resale/recycling, while household tires are collected for recycling at the Recycling Center. Composting of yard wastes or similar materials is not permitted on Shaw AFB due to the potential for attracting birds and the increase in bird air strike hazards as a result (Air Force 2004a, 2005b; HQ ACC 2006).

COMMUNICATIONS SYSTEM

The Command, Control, Communications, Computers and Intelligence blueprint for Shaw AFB identifies existing communications and information systems, shortfalls, planned improvements and transitional and implementation plans. Communications systems at the base include data communications, long-haul communications, information transfer, telephone switching and radio and security systems. The installation maintains a high-capacity digital data network using mode and multimode fiber optics to provide secure networking, electronic messaging (email) and other services. The current telephone switching system fully supports switching needs for mission changes, dial-up local area networks and additional programs and has ample trunk expansion capacity (Air Force 2004a).

The Shaw AFB data system network includes classified and unclassified data systems essential to operations of the 20 FW, USAFCENT and tenant units. Long-haul communications systems interconnect the voice and data systems with the wide area voice and data networks. These systems are periodically evaluated and improved as new technology becomes available. The base radio system consists of a land mobile radio network and very-high-frequency and ultra-high-frequency radios. These systems, which are vital for tactical control of aircraft, are all in excellent condition. The base also has a flightline video surveillance system and a video teleconferencing system (Air Force 2004a).

STORM DRAINAGE SYSTEM

Surface water features on Shaw AFB consist primarily of ditches, swales and canals associated with runways and taxiways, as these were created to remove stormwater runoff from the airfield and vicinity. Naturally occurring surface waters on the base include Long Branch along the northeast boundary, a tributary, Spann Branch, along the northern boundary, as well as Mush Branch, originating at the southwest corner of the base just south of U.S. Highway 76/378 (Figure 3.2-1). Long Branch flows to the southeast and off-base into Booth's Pond, Sawmill Pond, terminating in Mush Swamp. Waters from Long Branch and Mush Branch eventually flow into the Pocotaligo River, east of the base. Other surface waters on the installation include four constructed recreational ponds: No. 1 Golf Course Pond, No. 8 Golf Course Pond, Memorial Lake and Chapel Pond (Air Force 2009b).

Stormwater is also conveyed through pipes ranging from 12 to 72 inches in diameter. Drainage from the housing areas is channeled into three of the ponds at the golf course (Figure 3.2-1). Industrial process stormwater discharges are regulated by the SCDHEC NPDES permit program, which includes the requirement for a Stormwater Pollution Prevention Plan (SWPPP). Under this permit, stormwater is discharged at four permitted outfalls: two into Mush Branch

Creek and two into Long Branch Creek. Most of the area east of the runway discharges through outfall 004 to Long Branch Creek. Additionally, there are two other stormwater outfalls that do not require monitoring under the NPDES permit.

As part of the NPDES permit and the SWPPP, oil-water separators (OWS) are required throughout the installation. Of the total 36 OWSs, 19 are currently in use. The remaining OWSs are checked monthly and skimmed as required. The OWSs are pumped and cleaned annually (personal communication, Johnson 2008). The base includes approximately 400 acres of impervious surface, including the runways, flightline, ramps, roads, parking lots and buildings (Air Force 2009b).

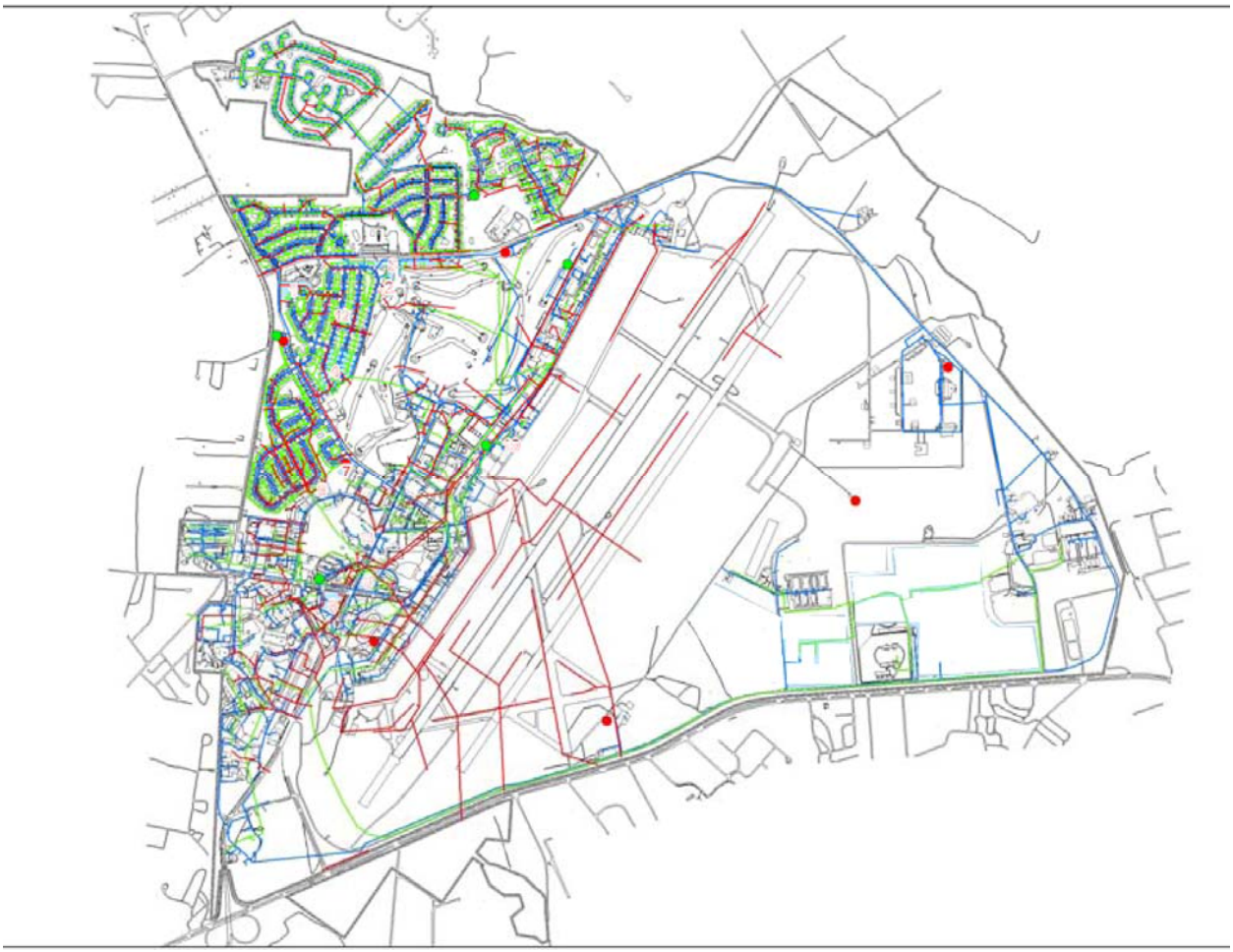


Figure 3.2-1. Shaw AFB Infrastructure

3.3 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.3.1 Definition of the Resource

Socioeconomic resources are defined as the basic attributes associated with the human environment, particularly population and economic activity. Population is described by the

change in magnitude, characteristics and distribution of people. Economic activity is typically composed of employment distribution, personal income and business growth. Any impact on these two fundamental socioeconomic indicators can have ramifications for secondary considerations, like housing availability and public service provision.

The planning and decision-making process for actions proposed by federal agencies involves a study of other relevant environmental statutes and regulations, including EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. The essential purpose of EO 12898 is to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal and commercial operations or the execution of federal, state, tribal and local programs and policies.

Because children may suffer disproportionately from environmental health risks and safety risks, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was introduced in 1997 to prioritize the identification and assessment of environmental health risks and safety risks that may affect children and to ensure that federal agency policy, programs, activities and standards address environmental risks and safety risks to children. This section identifies the distribution of children and locations where the number of children in the affected area may be proportionately high (e.g., schools, child care centers, etc.).

The ROI comprises Shaw AFB and the surrounding area of Sumter County, South Carolina. Socioeconomic and environmental justice information is presented for the ROI and, where appropriate, comparisons are presented with conditions for the state of South Carolina.

3.3.2 Existing Conditions

EMPLOYMENT AND UNEMPLOYMENT

In the ROI, total full- and part-time employment increased from 54,345 jobs in 2001 to 54,891 in 2007, at an average rate of 0.2 percent annually (Table 3.3-1). The largest contributions to employment in 2007 were made by manufacturing (14.9 percent) and government enterprises (22.6 percent), which combines employment related to federal, state and local government. The sectors of the economy exhibiting the greatest relative increase in jobs over the period 2001 to 2007 were real estate, administrative and waste services and health care. During that same time period, the contribution of the military to total employment decreased from 10.2 percent in 2001 to 9.4 percent in 2007 (U.S. Bureau of Economic Analysis 2009a). Employment in the government sector, including federal, state and local governments, decreased slightly between 2001 and 2006 from 12,920 jobs to 12,413 jobs in spite of the large military presence due to Shaw AFB, the largest employer in Sumter County. The manufacturing industry exhibited the greatest relative loss with the total loss of nearly 3,400 jobs between 2001 and 2007 decreasing from 11,586 jobs to 8,194 jobs. The manufacturing industry lost the majority of those jobs

between 2005 and 2007. About half of the top 16 employers in Sumter County are manufacturers (Table 3.3-2).

Table 3.3–1. Total Employment by Industry, Sumter County, 2007

Industry	NUMBER OF EMPLOYEES	
	2001	*2007*
Total employment	54,345	54,891
Farm employment	86	671
Nonfarm employment	53,659	54,220
Forestry, fishing, related activities and other	(D)	(D)
Mining	(D)	(D)
Utilities	107	108
Construction	3,732	4,343
Manufacturing	11,586	8,194
Wholesale trade	797	1,001
Retail trade	5,808	5,735
Transportation and warehousing	974	1,431
Information	532	475
Finance and insurance	1,271	1,252
Real estate and rental and leasing	947	1,756
Professional and technical services	999	1,289
Management of companies and enterprises	205	250
Administrative and waste services	1,867	2,619
Educational services	740	857
Health care and social assistance	4,283	4,892
Arts, entertainment and recreation	539	535
Accommodation and food services	2,927	3,374
Other services, except public administration	3,001	3,378
Government and government enterprises	12,920	12,413
Federal, civilian	1,128	1,197
Military	5,545	5,174
State and local	6,247	6,042

Note: (D)- not shown to avoid disclosure of confidential information, but included in totals.
Source: U.S. Bureau of Economic Analysis 2009a

Table 3.3–2. Major Employers, Sumter County, 2006

Employer	*Industry*	*Number of Employees*
Shaw Air Force Base	Military	6,866
Pilgrim's Pride	Poultry Processing[1]	2,150
Tuomey Healthcare System	Hospital	1,600
Sumter School District 17	Public Education	1,389
Sumter School District 2	Public Education	1,200
State of South Carolina	Government	1,060
Eaton Electrical (Cutler Hammer)	Electrical Services Manufacturer[1]	810
BD Pre analytical Solutions	Medical Supplies Manufacturer[1]	720
Sumter County Government	Government	520
Santee Print Works	Textiles Manufacturer[1]	500
City of Sumter	Government	500
Cooper Tools, Sumter Operation	Tools Manufacturer[1]	385
Wal-Mart	Retail	475
Color-Fi, Inc.	Plastics Manufacturer[1]	247
Caterpillar, Inc.-Precision Pins	Equipment Parts Manufacturer[1]	201
Interlake Material Handling	Steel Shelving Manufacturer[1]	211

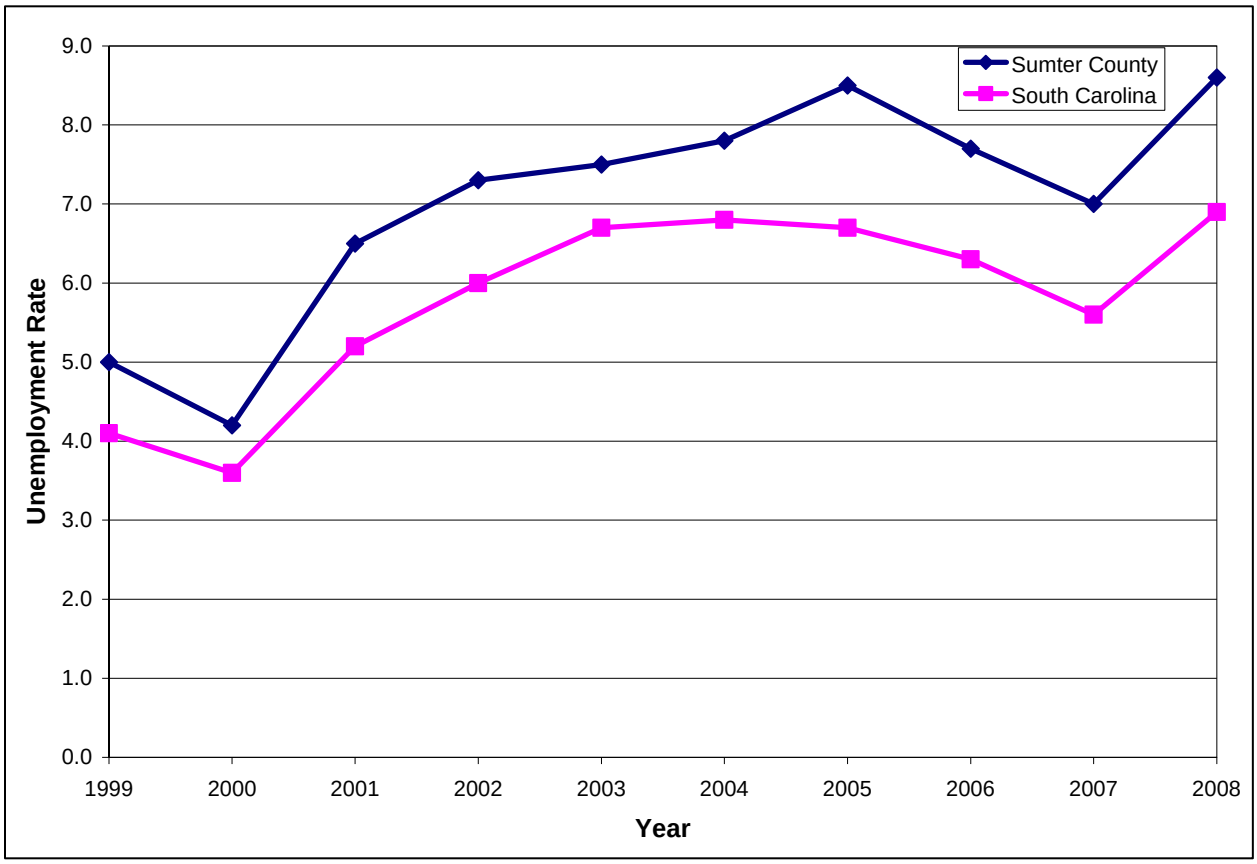
Note: 1. Indicates manufacturers.
Source: Sumter Economic Development 2009a, 2009b.

For the state of South Carolina, full- and part-time employment increased at an average rate of 1.7 percent annually between 2001 and 2007, at which time employment in the state was just over 2.5 million jobs. The sectors of the economy contributing the greatest number of jobs in the state over this period were retail trade, state and local government and manufacturing.

The unemployment rate in Sumter County fluctuated greatly between 1999 and 2008. In 2000, Sumter County experienced its lowest unemployment rate in this 9-year period, dropping to 4.2 percent. However, over the past 3 years, the unemployment rate has been increasing toward a high of 8.6 percent in 2008 (Figure 3.3-1). With its dependence on manufacturing, the economy of Sumter County has been particularly affected by the recent nationwide recession which began in 2007.

Unemployment in South Carolina has been lower than that of Sumter County during the same time period. In 2000, the unemployment rate for South Carolina was 3.6 percent and increased over time to reach a high in 2008 of 6.9 percent.

Figure 3.3-1. Unemployment Rate, Sumter County and South Carolina, 1999-2008



Source: U.S. Bureau of Labor Statistics 2009

EARNINGS AND INCOME

In 2001, total earnings in the ROI totaled over $2.1 billion and by 2007, total earnings in Sumter County were over $2.8 billion, an average annual increase of 4.7 percent (Table 3.3-3). Average earning per job in the ROI in 2007 amounted to $38,996 while per capita income was $31,103 (U.S. Bureau of Economic Analysis 2009b). The government remains as the largest generator of earnings for Sumter County followed by manufacturing and health care and social assistance. Approximately 57 percent of those earnings from the government sector are attributed to the military. Industries that contributed the most toward job earnings included military, state and local government, manufacturing and health care and social assistance.

Table 3.3–3. Earnings by Industry (in thousands), Sumter County, South Carolina, 2001-2007

Industry	*2001*	*2007*
Personal Income	$2,174,654	$2,868,105
Farm earnings	$13,315	$22,608
Nonfarm earnings	$1,629,570	$2,109,430
Forestry, fishing, related activities and other	(D)	(D)
Mining	(D)	(D)
Utilities	$7,640	$10,918
Construction	$116,951	$155,569
Manufacturing	$378,892	$388,900
Wholesale trade	$30,239	$56,489
Retail trade	$112,793	$125,575
Transportation and warehousing	$26,970	$58,223
Information	$16,684	$18,285
Finance and insurance	$44,533	$52,850
Real estate and rental and leasing	$11,125	$14,256
Professional and technical services	$32,902	$54,938
Management of companies and enterprises	$10,557	$15,114
Administrative and waste services	$28,801	$51,169
Educational services	$15,110	$20,026
Health care and social assistance	$140,139	$191,174
Arts, entertainment and recreation	$6,417	$6,433
Accommodation and food services	$33,044	$45,246
Other services, except public administration	$50,605	$69,042
Government and government enterprises	$554,601	$761,012
Federal, civilian	$52,847	$76,028
Military	$288,310	$438,343
State and local	$213,444	$246,641

Note: (D)- not shown to avoid disclosure of confidential information, but included in totals

Source: U.S. Bureau of Economic Analysis 2009b

Shaw AFB has been a strong component of the economy since it was established in 1941. In FY 2009, its calculated annual economic input to the local economy exceeded $504 million (Air

Force 2009d). The total annual payroll associated with Shaw AFB is $315 million including military and civilian personnel. An additional $28.6 million in expenditures is used for major construction contracts. The total annual expenditures for construction, services and supplies equal $45.8 million.

Per capita personal income in Sumter County increased by 4.7 percent per year between 2001 and 2007, while the state of South Carolina experienced slower growth with approximately 3.7 percent average annual growth over the same period (Table 3.3-4). Although Sumter County has experienced greater growth, it continues to lag behind the state's average.

Table 3.3–4. Per Capita Personal Income, Sumter, S.C.

	PER CAPITA PERSONAL INCOME	
State/County	*2001*	*2007*
Sumter County	$20,868	$27,576
South Carolina	$24,981	$31,103

Source: U.S. Bureau of Economic Analysis 2009b

ENVIRONMENTAL JUSTICE

Disadvantaged groups within the ROI, including low-income and minority communities, are specifically considered in order to assess the potential for disproportionate occurrence of impacts. Based on 2000 Census data, the incidence of persons and families in the ROI with incomes below the poverty level was comparable to state levels (U.S. Census Bureau 2000). In the ROI during 2000, 16.2 percent of persons and 21.6 percent of children were living below the poverty level, compared to 14.1 percent of persons and 18.5 percent of children in the state of South Carolina as a whole.

Minority persons represent just over half the ROI population (51.8 percent). African-American persons account for almost all of the minority population in the ROI, representing 46.7 percent of the county population of 104,646 persons (or 92 percent of the minority population). By comparison, 33.9 percent of the state population is represented by minority persons (U.S. Census Bureau 2000).

The youth population, those individuals age 18 and younger, accounts for 28.1 percent of the ROI population, compared to 25.2 percent at the state level. The senior population, those individuals age 65 and older, accounts for 11.2 percent of the ROI population and 12.1 percent of the state population (U.S. Census Bureau 2000).

3.4 CULTURAL RESOURCES

3.4.1 Definition of the Resource

Cultural resources include historic and prehistoric sites, structures, districts, artifacts, or any other physical evidence of human activities considered important to a culture or community for

traditional, religious, scientific, or other reasons. The ROI for cultural resources includes Shaw AFB and the Wateree Recreation Area. The area of focus within the ROI is the project locations.

Section 106 of the NHPA of 1966, as amended, requires federal agencies to take into account the effects of their actions on historic properties and requires archaeological surveys prior to surface disturbing activities in areas not previously surveyed. Agencies must allow the Advisory Council on Historic Preservation a reasonable opportunity to comment on any federal undertakings affecting cultural resources. The Section 106 process is part of the Air Force's Environmental Impact Analysis Process (EIAP), the program that implements NEPA (Air Force 2004b). The 20 FW does not have a Memorandum of Agreement (MOA) with the South Carolina SHPO; consultations are accomplished on a case-by-case basis. In the event that a project would result in an adverse effect to cultural resources, a project-specific MOA, including a mitigation plan, is drafted during the Section 106 consultation to resolve the adverse effect. The mitigation plan describes what steps the federal agency will take to reduce or lessen the anticipated effect caused by the Proposed Action.

Section 110 of the NHPA requires that federal agencies assume responsibility for identifying, evaluating, nominating and protecting historic properties under their control. Historic properties are cultural resources that are listed in, or eligible for listing in, the National Register of Historic Places (NRHP). Impacts to cultural resources may be considered adverse if the resources have been determined eligible for listing in the NRHP or have significance for Native American groups.

3.4.2 Existing Conditions

ARCHITECTURAL RESOURCES

The Air Force considers buildings constructed from 1946–1989 as Cold War era structures (Air Force 2006). Two studies have been completed on Cold War era resources (1946–1989) existing at Shaw AFB. One study performed a reconnaissance survey of 127 resource types built between 1945 and 1989. One resource, a documentary collection, was selected for documentation and evaluation. A second study, part of the DoD's Legacy Demonstration Project, sought to establish historic contexts for Cold War era resources on DoD facilities throughout South Carolina. While neither study fulfills Section 106 requirements, they do lay the groundwork for future evaluations of Cold War era resources at Shaw (Air Force 2006). The last evaluation of architectural resources was conducted in 1996. Resources that have attained 50-year-old status since that time require evaluation in order for the 20 FW to satisfy its Section 110 of the NHPA requirement.

In consultation with the South Carolina SHPO, two facilities related to Shaw AFB were determined to be eligible for inclusion on the NRHP: the Rosemary Fire Tower Complex at Poinsett Electronic Combat Range (PECR) and Hangar 611 on Shaw AFB. Built in 1942 along the southwestern edge of the flightline, Hangar 611 is a historically significant example of World War II-era industrial construction (Air Force 2004a, 2005b, 2005c).

ARCHAEOLOGICAL RESOURCES

The first large-scale archaeological investigations at Shaw AFB occurred in the early 1980s and intensified in the 1990s. Eight archaeological sites have been identified on Shaw AFB and 137 sites in the PECR; no sites have been identified in the Wateree Recreation Area (Air Force 2008a). Of the eight sites on Shaw AFB proper, none were determined to be eligible for listing on the NRHP while 36 sites within the PECR were deemed NRHP-eligible with one site still unevaluated (Air Force 2008a).

TRADITIONAL RESOURCES

Traditional resources are identified by Native American tribes or other groups and include properties of religious or cultural importance to an Indian tribe or native Hawaiian organization (Air Force 2004a). No formal surveys for traditional cultural resources or sacred sites have been conducted, nor have any tribes come forward and notified the 20 FW of the presence of such sites on Shaw AFB (Air Force 2006). The federally recognized tribe located nearest to Shaw AFB is the Catawba Indian Nation, near Rock Hill, South Carolina approximately 95 miles north of Shaw AFB (Air Force 2005a).

3.5 BIOLOGICAL RESOURCES

3.5.1 Definition of the Resource

The existing biological resources at Shaw AFB include terrestrial and aquatic communities, including wetlands, as well as individual flora and fauna species, of which some are locally, regionally, or nationally rare. The ROI includes Shaw AFB, the Wateree Recreation Area and the specific areas associated with the proposed C&D actions and alternatives. Due to the limited undeveloped area at Wateree, resource assessments are performed in-house by 20 CES Natural Resources Management staff for endangered species, fish and wildlife, enhancement of outdoor recreation and forestry. The adjacent lake is managed by Duke Power Company.

The following sections describe these biological resources as a baseline to understanding the potential impacts to each by the Proposed Action and Alternative 1. Detailed information on the installation's biological resources is available in the Shaw AFB Integrated Natural Resources Management Plan (Air Force 2007a).

3.5.2 Existing Conditions

TERRESTRIAL COMMUNITIES

Shaw AFB is located within the Southeastern Mixed Forest Province, also known as the Middle Atlantic Coastal Forest. The original forested areas were cleared in the 1940s when the base was commissioned. Because of subsequent extensive disturbance, few natural communities remain on the installation. Consequently, the base is now dominated by a disturbed/urbanized

community (84 percent) and pine plantation (13 percent). Oak/hickory forest, Pond/Pond Margin/Stream-head Pocosin and Hardwoods/Small Stream Forest account for the remaining 1 percent of terrestrial communities (Air Force 2007a).

Disturbed/Urbanized. The majority of the grounds on Shaw AFB are semi-improved to improved and intensively landscaped and maintained (Air Force 2007a). Aside from structures and pavement, improved and semi-improved landscaped areas include mowed lawn and field areas, as well as horticultural trees and shrubs (Air Force 2004a).

Pine Plantation. The pine plantations in the southeastern portion of the base consist primarily of 25- to 35-year-old loblolly pine trees. The trees are between 40 and 70 feet tall and spaced on 8-foot by 10-foot or 8-foot by 8-foot spacing. Current stocking varies from 150 to 600 trees per acre. The pine plantation is not considered to be ideal for red-cockaded woodpecker because the trees are generally too small, young, close and isolated to provide appropriate habitat (Air Force 2007a).

Oak/Hickory Forest. The oak/hickory forest community is locally restricted to the northern portion of Shaw AFB adjacent to the MFH area. In addition to a dominance of white oak, pignut hickory and mockernut hickory, other associated woody species include flowering dogwood, sparkleberry, loblolly pine and winged elm (Air Force 2007a). Species of wildlife that may inhabit this forest community include gray squirrel, southern flying squirrel, pileated woodpecker and blue jay (Air Force 2004a, 2005b).

WETLANDS, FLOODPLAINS AND FRESHWATER AQUATIC COMMUNITIES

Wetlands are subject to regulatory authority under several laws and regulations including Section 404 of the Clean Water Act (CWA) and EO 11990, *Protection of Wetlands*. In order for a wetland area to fall under the jurisdiction of Section 404 of the CWA, the three wetland delineation criteria, defined in the 1987 U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual,* must be met and the area must have a "significant nexus with navigable waters of the United States" (U.S. Environmental Protection Agency [USEPA] 2007). Wetlands occupy approximately 95 acres on Shaw AFB, but only 44 of these acres fall under the jurisdiction of the Section 404 of the CWA (personal communication, June 2008). All jurisdictional wetlands on Shaw AFB are located along Long Branch in the northern portion of the base. Hydrologically isolated, "nonjurisdictional" wetlands are not regulated by Section 404 of the CWA but are provided protection under EO 11990.

Floodplains on federal facilities are regulated under EO 11988, *Floodplain Management*. Floodplains on Shaw AFB are located along Long Branch in the northern portion of the base.

Freshwater aquatic communities on Shaw AFB include approximately 95 acres of wetlands, 19 acres of ponds and several miles of freshwater streams (Air Force 2007a). The biological habitats that occur in these communities are "small stream forest" and "ponds," which are described in greater detail below.

Small Stream Forest. Small stream forest wetland occurs along Long Branch, where it crosses the northeast corner of the base within the runway approach, and in Mush Swamp in the southwest corner of the base south of U.S. Highway 76/378. At the former location, hydrophytic (water-loving) species of trees within the wetland includes river birch, sweetgum, water oak and red maple. At the latter location, dominant canopy trees include laurel-leaf oak, hackberry, red maple and ash. Understory species in both areas include native species such as wax myrtle, common elderberry, willows and greenbriar and nonnative invasive species such as Japanese privet and Chinese privet. Wildlife typical of these wetlands include species such as two-toed amphiuma, muskrat, beaver, raccoon, white-tailed deer, wood duck and various frogs, toads, snakes and turtles (Air Force 2004b, 2005a).

Ponds. Pond wetlands occur only as artificially constructed features within the installation. Each of the four constructed ponds is located within the developed western portion of the base. Two of the ponds occur on the golf course, one is adjacent to the golf course and the other is behind the chapel. These ponds are managed for recreation (fishing and picnicking) and aesthetics and their margins are regularly mowed and trimmed of tall vegetation. Shallow areas fringing the ponds often support emergent wetland vegetation that includes species such as meadow beauty, smartweeds, seedbox, bugleweed, nama and water-spider orchid. Wildlife expected in these open water habitats includes stocked fish such as various sunfish, bullhead catfish and largemouth bass and birds such as resident Canada geese, mallards and kingfishers (Air Force 2004a).

THREATENED, ENDANGERED AND SPECIAL CONCERN SPECIES

Section 7 of the federal ESA, as amended, requires each federal agency to ensure that "any action authorized, funded, or carried out by such agency… is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species… unless such agency has been granted an exemption for such action…". Additionally, animals designated by South Carolina as endangered or threatened are granted legal protection by the state.

The South Carolina Department of Natural Resources Rare, Threatened and Endangered Species List was accessed to produce a list of rare flora and fauna known to occur within Sumter County and that have the potential to occur on Shaw AFB. Table 3.5-1 provides information on six threatened and endangered species known to occur in Sumter County, South Carolina. Table 3.5-1 provides information on the 22 species of special concern known to occur in Sumter County, South Carolina. Both tables include summary descriptions of habitat typical for each species (South Carolina Department of Natural Resources 2006).

Table 3.5–1. Threatened and Endangered Species Known in Sumter County, South Carolina

Scientific Name	*Common Name*	*Legal Status*	*Special Concern Status**	*Habitat*
Plants				
Oxypolis canbyi	Canby's dropwort	FE/SE	SC	Cypress ponds and sloughs; wet savannas
Schwalbea americana	Chaffseed	FE/SE	—	Pond margins and wet savannas; land ridge forest
Mammals				
Corynorhinus rafinesquii	Rafinesque's big-eared bat	SE	—	Pine and hardwood forest; caves; abandoned buildings
Birds				
Haliaeetus leucocephalus	Bald eagle	FT/SE	—	Edges of lakes and large rivers; seacoasts
Picoides borealis	Red-cockaded woodpecker	FE/SE	—	Open pine woods; pine savannas
Sterna antillarum	Least tern	ST	—	Sandy beaches; sandbars

SC= Of Special Concern; FE= Federal Endangered; FT= Federal Threatened; SE= State Endangered; ST= State Threatened (animals only)

Table 3.5–2. Special Concern Species Known in Sumter County, South Carolina (Page 1 of 2)

Scientific Name	*Common Name*	*Legal Status*	*Special Concern Status**	*Habitat*
Plants				
Aristida condensate	Piedmont three-awned grass	—	SC	Sandridges
Carex decomposita	Cypress-knee sedge	—	SC	Swamps and lake margins on floating logs
Carya myristiciformis	Nutmeg hickory	—	RC	Wet floodplain forests
Chamaedaphne calyculata	Leatherleaf	—	SC	Wetlands and bogs
Cyperus lecontei	Leconte's flatsedge	—	SC	Sand dune swales; pond margins
Echinodorus parvulus	Dwarf burhead	—	SC	Shallow pools and ponds
Echinodorus tenellus	Dwarf burhead	—	SC	Shallow pools and ponds
Eleocharis robbinsii	Robbin's spikerush	—	SC	Pine savanna ponds
Eupatorium recurvans	Coastal-plain thorough-wort	—	SC	Depressions
Lobelia boykinii	Boykin's lobelia	—	SC	Cypress ponds; swamp margins
Nestronia umbellata	Nestronia	—	SC	Oak-hickory-pine woods; often in transition areas between flatwoods and uplands
Plantago sparsiflora	Pineland plantain	—	SC	Open, wet pine savannas; shallow ditches and seeps

Table 3.5-2. Special Concern Species Known in Sumter County, South Carolina (Page 2 of 2)

Scientific Name	*Common Name*	*Legal Status*	*Special Concern Status**	*Habitat*
Plants				
Rhexia aristosa	Awned meadow-beauty	—	SC	Pond margins and wet savannas
Rhexia cubensis	West Indian meadow-beauty	—	SC	Wet savannas including cutthroat seeps, flatwoods and bogs
Rhynchospora scirpoides	Long-beaked baldrush	—	SC	Floating mats in ponds; pond margins
Ruellia caroliniensis	Wild petunia	—	SC	Woods and wood margins
Sagittaria isoetiformis	Slender arrow-head	—	SC	Sandy ponds and bogs
Scleria baldwinii	Baldwin's nutrush	—	SC	Wetlands
Amphibians				
Acris crepitans crepitans	Northern cricket frog	—	SC	Margins of shallow ponds or marshy areas
Reptiles				
Micrurus fulvius	Eastern coral snake	—	SC	Hardwood forest; pine flatwoods; marshes
Mammals				
Ursus americanus	Black bear	—	SC	Large undeveloped wooded tracts
Birds				
Ictinia mississippiensis	Mississippi kite	—	SC	Woodlands and brushy areas; near water

— = No status designation; SC= Of Special Concern; RC= Of Regional Concern (plants only).
*The status designations in this column do not confer legal protection; these species are of special concern in the state because their populations may be declining.
Source: South Carolina Department of Natural Resources 2006; Air Force 2004a

Federally listed candidate species are not known to occur on Shaw AFB. The only known State listed species on the installation is the least tern, a colony of which nests on the flat roof of the Base Exchange (BX) building (Air Force 2007a) and is the farthest inland breeding colony recorded for South Carolina. This bird preys exclusively on live fish captured by plunge-diving into water bodies. The species prefers to nest along coastal beaches but has adapted to nesting on flat, graveled rooftops when its preferred habitat is not available (Air Force 2004a). The least terns typically nest at the BX from mid-April to late July (Air Force 2007a). In 2009, 11 breeding pairs were observed on the BX roof (personal communication, Hovis 2009).

3.6 WATER RESOURCES

3.6.1 Definition of the Resource

Water resources include surface waters and groundwater features, stormwater runoff and floodplains. Surface waters on Shaw AFB include ponds, streams and other wetlands. Groundwater used as a potable water source is also addressed in Section 3.2.2.2 as an infrastructure resource. The ROI for this resource is Shaw AFB and the Wateree Recreation Area.

3.6.2 Existing Conditions

SURFACE WATER

Shaw AFB is located within the Southern Coastal Plain physiographic region of South Carolina. Spann Branch and Long Branch Creeks are the major naturally occurring surface water features on Shaw AFB. Spann Branch flows along the northern boundary of the base into Long Branch. Long Branch runs along the northeast edge of the base, into Booth's Pond, Sawmill Pond and then into Mush Swamp. From there, the creeks become part of the headwaters of the Pocotaligo Swamp, which flows into the Black River, which empties into Atlantic Ocean near Georgetown, South Carolina (Air Force 2004b). Figure 3.6-1 and Figure 3.6-2 display the water resources available on Shaw AFB including surface water and wetlands as it relates to the Proposed Action and Alternative 1.

Surface water features within the base consist primarily of canals and ditches associated with runways and taxiways. These ditches were created for the purpose of removing stormwater runoff from airfield areas. The base also maintains four artificial impoundments: Chapel Pond, Memorial Lake, No. 1 Hole Golf Course Pond and No. 8 Hole Golf Course Pond. These ponds are maintained for fishing, picnicking and aesthetic value.

Stormwater runoff from the base is regulated by the SCDHEC NPDES permit program. Under the base NPDES permit, stormwater is discharged through four permitted stormwater outfalls and two outfalls that are not regulated by a permit. The areas drained by outfalls on Shaw AFB are described in Table 3.6-1.

Table 3.6–1. Outfalls and Areas Drained on Shaw AFB

Outfall #	*Area Drained*	*Receiving Water*	*Residential*	*Non-Residential Impervious (roads, buildings, etc.)*	*Golf Course*	*Undeveloped/ Unpaved*	*Total (acres)*
002	West of runway	Long Branch Creek	110	228	200	45	583
003	Southeast portion of base	Mush Branch Creek	39	230	0	318	587
004	East of runway	Long Branch Creek	0	200	0	1,027	1,227
005	Northern portion of base	Long Branch Creek	0	13	0	84	97
006	Northern portion of base	Booth's Pond	0	17	0	163	180
007	JP-8 bulk storage	Mush Branch Creek	0	1	0	0	1
		Total	149	689	200	1,637	2,675

Source: Air Force 2009a

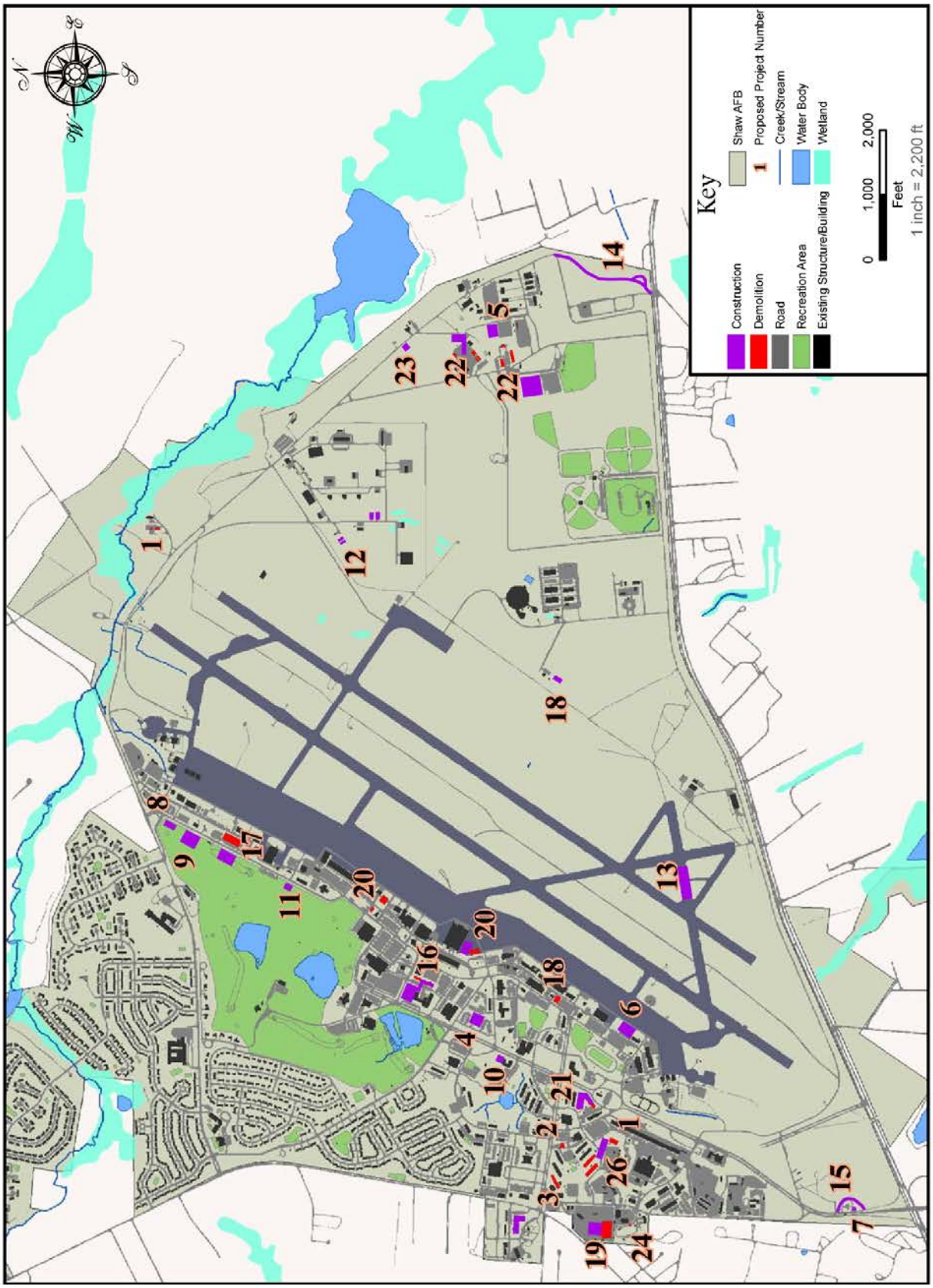


Figure 3.6-1. Water Resources at Shaw AFB under the Proposed Action

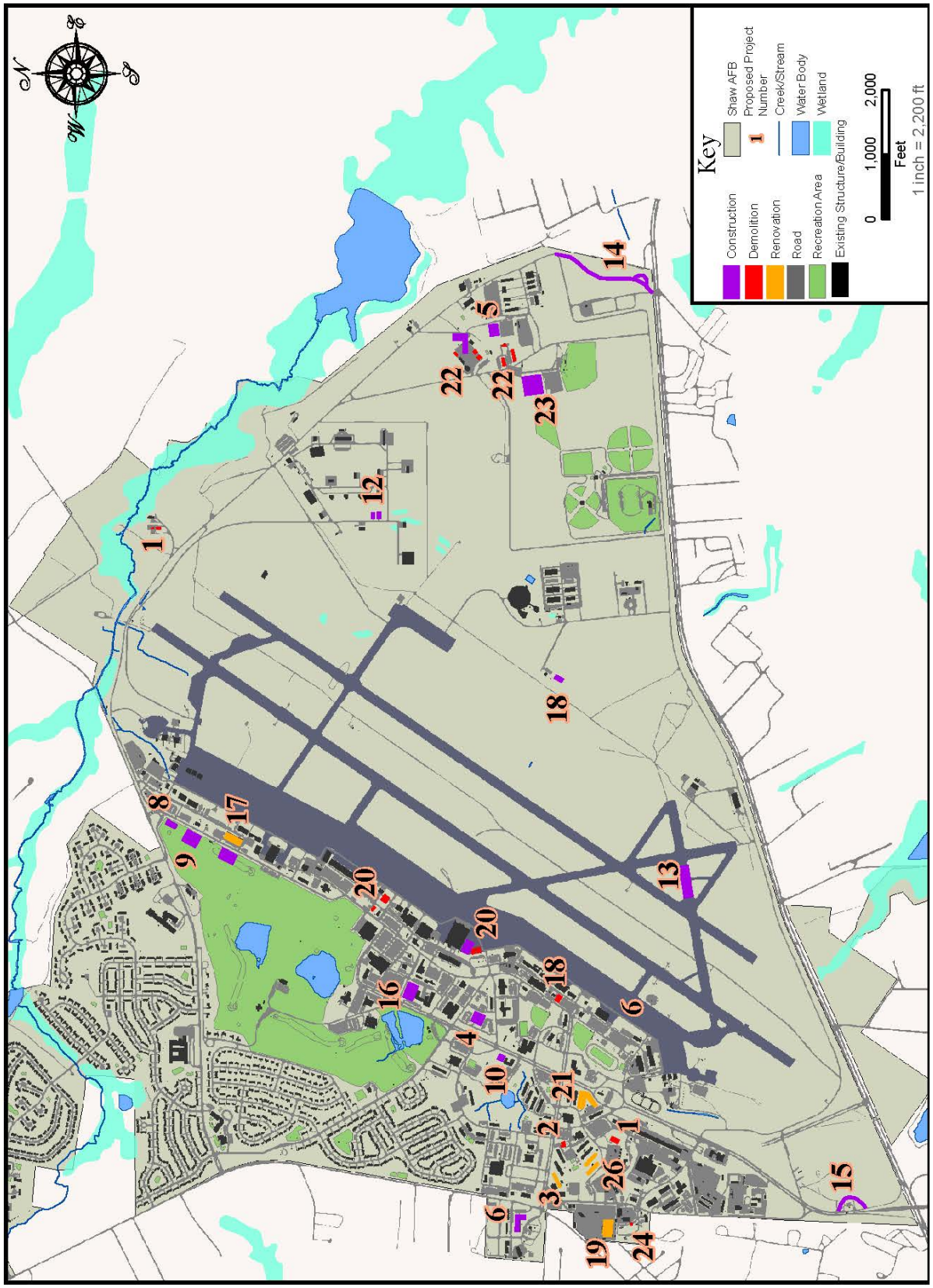


Figure 3.6-2. Water Resources at Shaw AFB under Alternative 1

SURFACE WATER QUALITY

Water quality of surface water resources may be impacted by point and nonpoint sources of pollutants. Water bodies are classified by the state based on their water quality and discharges that can affect water quality are regulated through permits.

The Pocotaligo River and its tributaries, including Long Branch, have been designated by South Carolina as "freshwaters," indicating that they are suitable for secondary contact recreation, drinking water supply after conventional treatment, fishing and the survival and propagation of a balanced indigenous aquatic community of flora and fauna (Air Force 2004a). No waters are classified as Outstanding Resources Waters within 1 mile of Shaw AFB. Also, there are no water bodies on or near Shaw AFB listed on South Carolina's Section 303(d) list of impaired water bodies (SCDHEC 2006).

Unlike pollution from industrial and sewage treatment sources, nonpoint source (NPS) pollution comes from nondiscrete sources. As rainfall runs off the land and man-made structures, natural and man-made pollutants are picked up, transported and ultimately deposited into lakes, rivers, wetlands, coastal waters and groundwater. These pollutants may have harmful effects on water quality, adversely affecting drinking water supplies, recreation, wildlife and fisheries. Potential NPS pollution at Shaw AFB originates from fertilizers, herbicides and insecticides used in landscaped and developed areas; hydrocarbon and chemical runoff from parking lots, roadways and sediment runoff from construction sites and land clearing.

GROUNDWATER

Three aquifer systems are located beneath Shaw AFB. They consist of the Middendorf Aquifer, Black Creek Aquifer and the shallow aquifer system, which includes the Lang Syne Formation and the Duplin Formation.

The Middendorf (Tuscaloosa) Aquifer is the most productive of the aquifer systems in the western portion of Sumter County. The aquifer is approximately 250 feet thick and is encountered at about –50 feet mean sea level in the Shaw AFB area. The Middendorf Aquifer is confined by a 15- to 75-foot-thick clay layer located at the base of the Black Creek Formation (Air Force 2004b).

The five water supply wells currently located on Shaw AFB are screened in the Black Creek Aquifer. The Black Creek Aquifer is separated into upper and lower portions by a confining layer. The upper aquifer is approximately 50 to 70 feet thick, while the lower aquifer ranges from 75 to 105 feet thick. Wells completed in the Black Creek Aquifer are capable of yielding up to 750 gpm (Air Force 2004b).

The Lang Syne Formation of the Black Mingo Group and the Duplin Formation make up the shallow aquifer system in the Shaw AFB area. The Lang Syne Aquifer is located in the northwestern portion of Shaw AFB, northwest of the Orangeburg Scarp, while the Duplin

Aquifer is present southeast of the scarp. The two aquifers are not hydraulically connected due to the presence of the fine-grained Sawdust Landing Formation, considered an aquitard, underneath the Lang Syne Aquifer (Air Force 2004b).

3.7 AIR QUALITY

3.7.1 Definition of the Resource

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin and the prevailing meteorological conditions. The levels of pollutants are generally expressed on a concentration basis in units of part per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). For this air quality analysis, the ROI centers on Sumter County for both the Proposed Action and Alternative 1 sites located on Shaw AFB.

Emissions associated with construction activities are the main issues generated by the Proposed Action and are the focus of the air analysis. Air quality issues associated with operational activities at Shaw AFB after the completion of construction are not included in this evaluation.

The emissions sources analyzed for the Proposed Action include heavy construction machinery, semi-tractor trailer rigs, dust (particulate matter) from unpaved roads and vehicle exhaust emissions from employees' personal vehicles.

3.7.2 Existing Conditions

BASELINE AIR QUALITY

The baseline standards for pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) and state air quality standards. These standards represent the maximum allowable atmospheric concentration that may occur and still protect public health and welfare. Further discussion of the NAAQS and state air quality standards are included in Appendix B.

For analysis purposes, the emissions from the Proposed Action will be compared to the Sumter County emissions obtained from the USEPA's 2002 National Emissions Inventory (NEI), which are presented in Table 3.7-1. The county data includes emissions data from point sources, area sources and mobile sources. *Point sources* are stationary sources that can be identified by name and location. *Area sources* are point sources whose emissions are too small to track individually, such as a home or small office building or a diffuse stationary source, such as wildfires or agricultural tilling. *Mobile sources* are any kind of vehicle or equipment with gasoline or diesel engine, an airplane, or a ship. Two types of mobile sources are considered: on-road and nonroad. *On-road* sources consist of vehicles such as cars, light trucks, heavy trucks, buses, engines and motorcycles. *Nonroad* sources are aircraft, locomotives, diesel and gasoline boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction equipment and recreational vehicles (USEPA 2008).

Table 3.7–1. Baseline Emissions Inventory for Sumter County, South Carolina

	EMISSIONS (TONS/YEAR)					
Source Type	*CO*	*NO_x*	*VOCs*	*SO_2*	*PM_{10}*	*$PM_{2.5}$*
Area Source	4,301	553	4,875	726	14,974	1,400
Nonroad Mobile	6,015	665	504	53	7,433	54
On-Road Mobile	23,443	2,786	1,840	104	7,508	55
Point Source	968	258	968	233	61	46
Total	**33,886**	**4,275**	**8,747**	**1143**	**7,864**	**1,555**

CO = carbon monoxide; NO_x = nitrogen oxides; VOC = volatile organic compounds; SO_2 = sulfur dioxide; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 10 microns in diameter.
Source: USEPA 2002

The Shaw AFB 2005 Annual Air Emissions Report summarizes the emissions generated from all point sources located on the installation. The Calendar Year 2005 emissions are summarized in Table 3.7–2.

Table 3.7–2. Calendar Year 2005 Air Emissions Inventory, Shaw AFB

	EMISSIONS (TONS/YEAR)					
Source Type	*CO*	*NO_x*	*PM_{10}*	*SO_2*	*VOCs*	*HAPs*
Stationary Sources	20.58	24.99	3.69	1.73	40.62	3.63
Mobile Sources	23.13	7.00	3.47	0.23	2.87	0.12
Total	**43.71**	**31.99**	**7.16**	**1.96**	**43.49**	**3.75**

CO = carbon monoxide; NO_x = nitrogen oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; SO_2 = sulfur dioxide; VOC = volatile organic compounds; HAPs = Hazardous Air Pollutants
Source: Air Force 2008b

REGULATORY SETTING

The Federal Clean Air Act of 1963 and its subsequent amendments establish air quality regulations and the NAAQS and delegate the enforcement of these standards to the states. The SCDHEC enforces air pollution regulations and sets guidelines to attain and maintain the national and state ambient air quality standards within the state of South Carolina. For nonattainment regions, states are required to establish a State Implementation Plan (SIP) that is designed to reduce emissions to a level that will bring the regions into compliance with the NAAQS by specific deadlines. Control measures proposed in the SIP and adopted by the SCDHEC are incorporated into the SCDHEC *Regulation 61-62 – Air Pollution Control Regulations and Standards* (SCDHEC 2009a).

The USEPA recently implemented the new eight-hour Ozone (O_3) and 24-hour and annual particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$) national standards (see Air Quality, Appendix B). Based on data from 2006-2008, five counties (Abbeville, Aiken, Pickens, Spartanburg and York) had one monitor and one county (Richland) had two monitors with concentrations of O_3 above the revised standards. On September 16, 2009, the USEPA announced it would reconsider the 2008 standards for ground-level O_3, therefore SCDHEC will not continue efforts on the boundary recommendations for the 2008 O_3 standard until the final USEPA decision is released in August 2010 (SCDHEC 2009b). Currently, Sumter County and

Shaw AFB are located in an air quality attainment district (Environmental Quality Control Region 4) (SCDHEC 2009c; USEPA 2009).

GREENHOUSE GASES

Historically, non-transportation mobile sources (including construction equipment) are responsible for about 2.1 percent of the greenhouse gas (GHG) emissions in the nation. Transportation sources emit 27 percent, industry 41 percent and other U.S. sources emit 31 percent of the GHGs (USEPA 2006).

3.8 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

3.8.1 Definition of the Resource

Hazardous materials are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act; the Occupational Safety and Health Act; and the Emergency Planning and Community Right-to-Know Act. Hazardous materials have been defined in AFI 32-7086, *Hazardous Materials Management*, to include any substance with special characteristics that could harm people, plants, or animals.

Hazardous waste is defined in the Resource Conservation and Recovery Act (RCRA) as any solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that could or do pose a substantial hazard to human health or the environment. Waste may be classified as hazardous because of its toxicity, reactivity, ignitibility, or corrosivity. In addition, certain types of waste are "listed" or identified as hazardous in 40 CFR Part 263. The ROI for hazardous materials and waste management is Shaw AFB and the Wateree Recreation Area.

3.8.2 Existing Conditions

HAZARDOUS MATERIALS

The majority of hazardous materials used by Air Force and contractor personnel at Shaw AFB are controlled through an Air Force pollution prevention process called Hazardous Material Management Process (HMMP). This process provides centralized management of the procurement, handling, storage and issuing of hazardous materials and turn-in, recovery, reuse, or recycling of hazardous materials. The HMMP includes review and approval by Air Force personnel to ensure users are aware of exposure and safety risks.

HAZARDOUS WASTE

Shaw AFB is a large-quantity hazardous waste generator. Hazardous wastes generated during operations and maintenance activities include solvents, metal-contaminated spent acids and sludge from wash racks. Shaw AFB recycles all lubricating fluids, batteries, oil filters and shop rags. Hazardous wastes are managed in accordance with Shaw AFB *Hazardous Waste Management Plan*.

ASBESTOS WASTE/LEAD BASED PAINT MANAGEMENT

An asbestos management plan provides guidance for the identification of ACMs and for the management of asbestos. The 20 FW *Asbestos Management Plan* (Air Force 2009a) provides guidance for the 20 FW and associated tenant at Shaw AFB. An asbestos facility register is maintained by the 20 CES. The design of on-base building alteration projects and self-help request projects are reviewed to determine if ACMs are present in the proposed work area and if so, are disposed of properly.

The 20 FW *Lead-Based Paint Management Plan* is designed to establish management and organizational responsibilities and procedures for identifying, evaluating, managing and abating lead-based paint (LBP) hazards. The plan focuses on (1) preventing new hazards from developing; (2) protecting facility occupants, especially children under age seven and workers from LBP hazards; and (3) ensuring compliance with all applicable environmental protection requirements and all laws and regulations pertaining to LBP activities (Air Force 2008c).

Table 3-8.1 lists facilities proposed for demolition or construction and associated demolition under the Proposed Action and the known or anticipated presence of LBP in those facilities. Structures built before 1977 are expected to contain LBP. There is evidence of ACMs in Buildings 1708 and 403. ACM surveys for the remaining facilities would be completed prior to construction or demolition activities in accordance with the Shaw AFB *Asbestos Management Plan* (Air Force 2009a).

Table 3.8–1. ACM and LBP at Facilities to be Demolished/Renovated under the Proposed Action
(Page 1 of 2)

Project Number	*Project Activity and Facility Affected*	*Constructed*	*LBP Expected*
Demolition			
VLSB023004	Demolish Building 218 Building 1707 Building 1708	 1966 1959 1959	 Yes Yes Yes
VLSB070097	Demolish Building 403	1953	Yes
VLSB090055	Demolish Building 400	1953	Yes
VLSB090027	Demolish Chlorine Chambers	N/A	No
Expansion and New Construction			
VLSB993003	Expand Building 1109	1983	Yes
VLSB053002	Expand Building 912	1957	Yes
Construction and Related Demolition			
VLSB073002	Expand Building 1130 and demolish Building 1128 Building 1129	1956 1956 1956	Yes Yes Yes
VLSB093011	Demolish Building 1604	1972	Yes
VLSB093001	Demolish Building 700	1964	Yes
VLSB043006	Demolish Building 325	1956	Yes

Table 3.8–2. ACM and LBP at Facilities to be Demolished/Renovated under the Proposed Action
Page 2 of 2

Project Number	*Project Activity and Facility Affected*	*Constructed*	*LBP Expected*
Construction and Related Demolition			
VLSB113003	Demolish		
	Building 1211	1958	Yes
	Building 1212	1958	Yes
	Building 1501	1955	Yes
	Building 1517	1982	Yes
VLSB093010	Demolish		
	Building 430	1971	Yes
	Building 428	1959	Yes
VLSB983005	Demolish		
	Building 1821	1960	Yes
	Building 1830	1991	No
	Building 1832	1966	Yes
	Building 1836	1974	Yes
	Building 1850	1969	Yes
	Building 1851	1969	Yes
	Building 1852	1969	Yes
	Building 1856	1982	No
VLSB065001	Wateree Recreation Area Improvements Construct new Bath House Upgrade Septic System	NA	NA

ERP

The DoD developed the ERP to identify, investigate and remediate potentially hazardous material disposal sites that existed on DoD property prior to 1984. The *Shaw Air Force Base Environmental Restoration Program Site Status Summaries* dated December 2007 (Air Force 2007c) summarizes the status of the installation's environmental programs and presents a comprehensive strategy for implementing actions necessary to protect human health and the environment. This strategy integrates activities under the ERP and associated environmental compliance programs to support full restoration of the base.

ACC policy requires that any proposed construction project on or near a Shaw AFB ERP site be coordinated through the Shaw ERP Manager. Implementing the Proposed Action would result in construction activities occurring on or near the following ERP sites: OT-16A (OU-2A), OT-16B (OU-2B), OT-16C (OU-2C), SD-23, SD-29, SS-35, SS-36, ST-24, ST-27 and WP-12. Table 3.8-2 lists the Proposed Action projects and adjacent ERP sites. Figures 3.8-1 and 3.8-2 display the location of Shaw AFB's ERP sites as they relate to the Proposed Action and Alternative 1.

Table 3.8–3. Proposed Action Projects and Adjacent ERP Sites

Project Number	*Project Title/Description*	*Map Location*	*Adjacent ERP Sites*
VLSB023004	Demolish Base Engineer Facilities Buildings 218, 1707 and 1708	1	OT-16B, OT-16C, SS-36
VLSB070097	Demolish Building 403 Heat Plant	2	OT-16B, OT-16C
VLSB090055	Demolish Building 400 Airman Leadership School	3	OT-16B
VLSB090027	Demolish Chlorine Chambers at Wastewater Treatment Plant (WWTP)	24	OT-16A, OT-16B
VLSB993003	Expand Building 1109 Communications Facility	4	OT-16B, SS-35
VLSB073001	Construct United States Air Forces Central Command (USAFCENT) Operations Facility	5	None
VLSB043004	Construct Field Training Detachment Aircraft Maintenance Training Facility	6	OT-16B
VLSB080066	Construct Fire Satellite Station	8	SS-36
VLSB043002	Construct New Operations Group/Maintenance Group Facility	9	SS-36
VLSB053002	Expand Building 912, Chapel	10	SS-35
VLSB113004	Construct Aircraft Maintenance Mobility Equipment Storage Facility	11	SS-36
VLSB103003	Munitions Storage Magazine (2 igloos)	12	None
VLSB103004	Construct New Arm/De-Arm Pad	13	None
VLSB093013	Construct New Gate on East Side of Base with Necessary Road Improvements	14	None
VLSB090024b	Road Realignment at Main Gate around Visitor's Center	15	None
VLSB073002	Expand Headquarters (HQ) United States Air Forces Central Command (USAFCENT) Building 1130 and Demolish Buildings 1128 and 1129	16	ST-27
VLSB093011	Demolish Building 1604 (Existing Logistics Readiness Squadron Facility) and Construct New Logistics Readiness Squadron Facility	17	SS-36
VLSB093001	Demolish Building 700 and Construct New Radar Approach Control Facility	18	SS-35, WP-12
VLSB043006	Demolish and Replace with New Construction Building 325 (Vehicle Maintenance Facility)	19	OT-16A, OT-16B, SD-23 and ST-24
VLSB113003	Demolish Buildings 1211, 1212, 1501, 1517 and Construct New Armament Flight Maintenance and Storage Facility	20	SD-29, SS-35
VLSB093010	Demolish Buildings 430 and 428 and Replace with New Dormitory	21	OT-16B, OT-16C
VLSB983005	Demolish Eight Facilities and Construct 682nd Air Support Operations Squadron (ASOS) Complex	22	None
VLSB105001	Construct Vehicle Storage Yard	23	None
VLSB065001	Wateree Recreation Area Improvements	Wateree	None

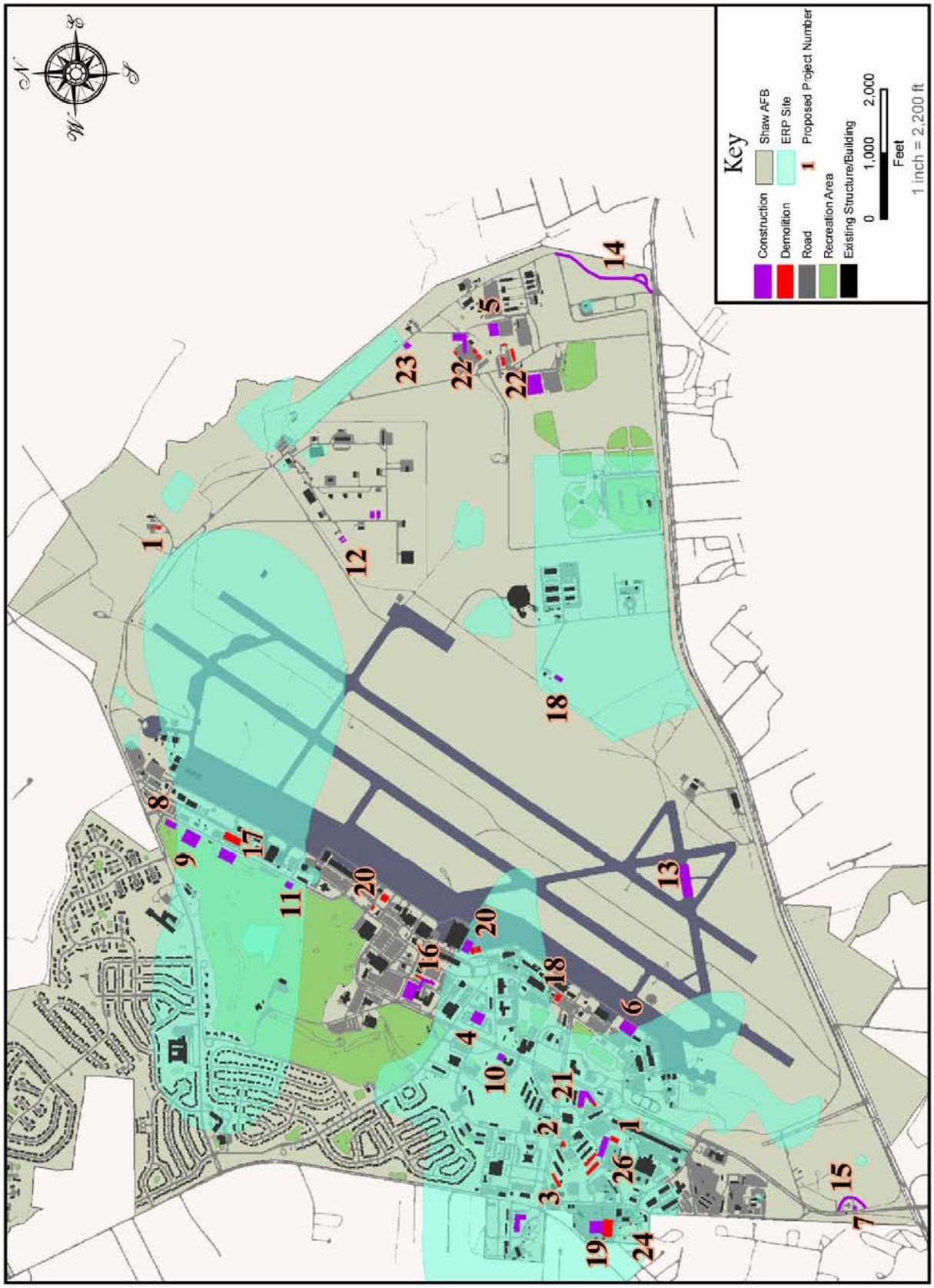


Figure 3.8-1. ERP Sites at Shaw AFB under the Proposed Action

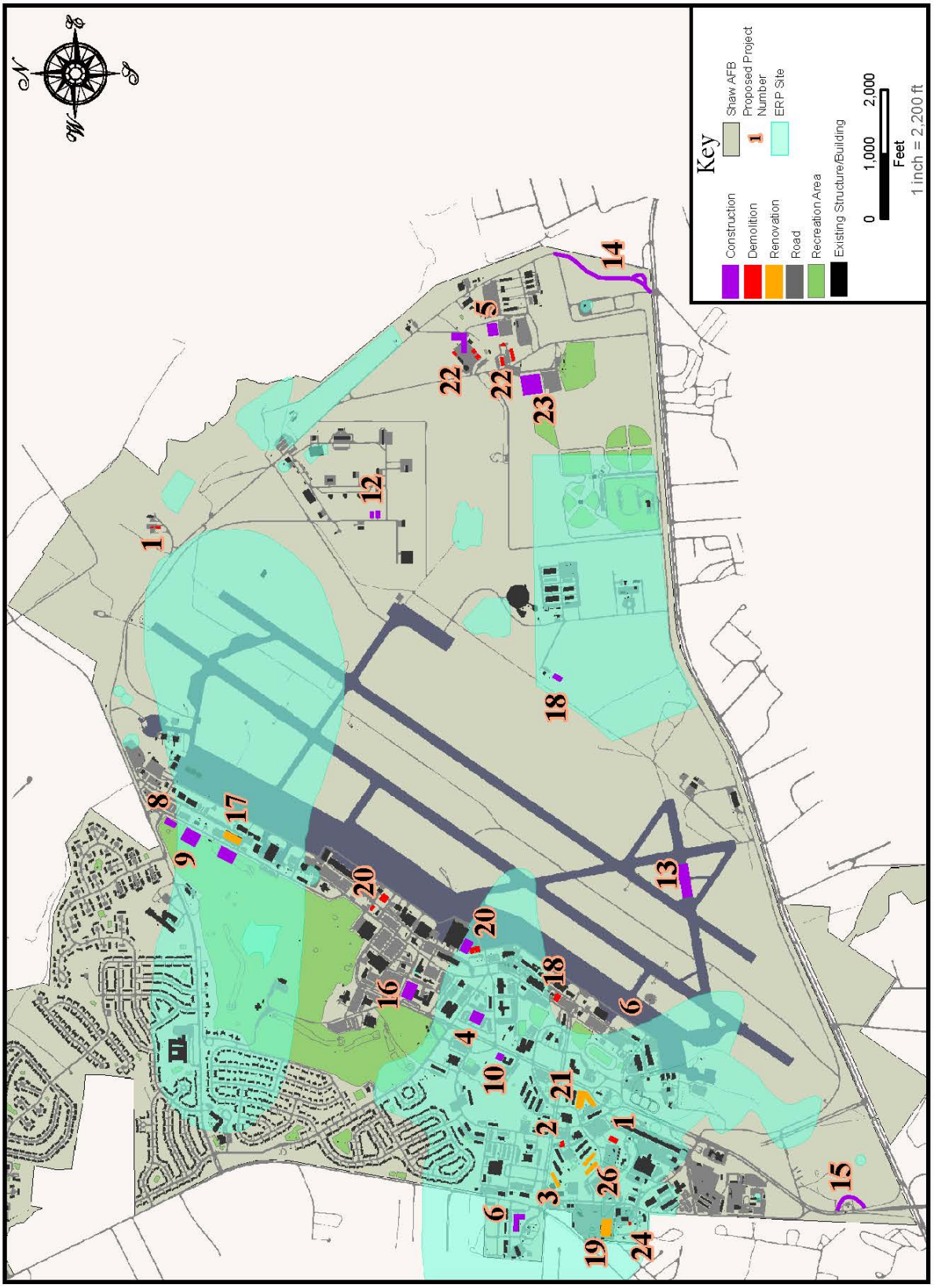


Figure 3.8-2. ERP Sites at Shaw AFB under Alternative

OT-16A (OU-2A) refers to the dieldrin contamination in soils and groundwater associated with Building 325 (the Vehicle Maintenance Area) located directly east of the off-Base Carolina Mobile Home Park (CMHP). Two culverts originate from the direction of Building 325 and terminate at a ditch located on property owned by the CMHP. Water previously discharged from the culvert into the ditch resulted in stained soil on CMHP property. Upon discovery, the culvert was blocked to prevent further off-site discharge. In September 1995, the first Decision Document was approved and the site closed.

The site was subsequently re-opened by SCDHEC to address undelineated dieldrin contamination in groundwater. In the spring of 1999, the Air Force accomplished a Phase II RCRA Facility Investigation in and around Building 325 to delineate the nature and extent of dieldrin present. The dieldrin groundwater plume encompasses approximately 23.5 acres on both Air Force and CMHP property. Dieldrin was also found in surface soils at the CMHP. A limited soil removal action in January 2002 removed the contaminated soil from the CMHP property. The Air Force completed a focused Corrective Measures Study (CMS) in October 2002. In April 2009, the Air Force and SCDHEC reached an agreement for a corrective measure on this site. The Air Force will conduct annual public information meetings via the Restoration Advisory Board, mail informational fact sheets to off-base property owners impacted by the dieldrin plume and conduct periodic groundwater monitoring for 15 years. The Air Force submitted a CMS in May 2009 and SCDHEC approved the document in May 2009. The RCRA permit renewal effective August 2009 included selection of the final remedy for the site. A Corrective Measure Implementation work plan was submitted in September 2009 and SCDHEC approval is pending.

OT-16B (OU-2B) was first investigated as part of the Vehicle Maintenance Area (OT-16) study; however, the Remedial Investigation revealed the source of the contamination did not originate from the Vehicle Maintenance Area (Building 325), but from an area closer to the POL yard.

The principal contaminants detected in the shallow (Duplin) groundwater are the industrial solvents trichloroethylene (TCE), perchloroethylene (PCE) and 1,1-dichloroethylene. Within the underlying Black Creek Aquifer there are two plumes in the Upper Black Creek Aquifer and another plume of TCE and PCE in the Lower Black Creek Aquifer. Plume 1, to the southwest, extends from the runways to beyond the west fence line. Plume 2, to the northeast, extends from the runways (near Building 1200) to the Officer's Club. Plume 2 was designated as ERP site SS-35 (OU-2D) and is described below. The plumes are commingled and encompass approximately 640+ acres in the Upper Black Creek Aquifer and are moving towards the Wateree River Basin.

The Final Corrective Measure is a pump and treat system with hydraulic containment of the plume in the western portion of the Base and land use controls (LUCs) for affected private property owners. To support LUCs in the final remedy, the Air Force completed an extensive well inventory in 2006 to provide a baseline ensuring no current residents utilize contaminated groundwater. Currently, agreements between the Air Force and SCDHEC regarding LUC

management of the off-base portion of the plume are pending final implementation, but will include Bilateral Agreements between the Air Force and the private property owners and other layers of protective LUC components.

OT-16C (OU-2C) originally was investigated as part of the Vehicle Maintenance Area (OT-16) study; however, during the Remedial Investigation it became apparent the source of the TCE contamination in the Lang Syne Aquifer did not originate from that area as the volatile organic compound (VOC) contamination found there did not match the contaminants within the OT-16/OT-16A (OU-2A) source area. The regulatory agencies then agreed to administratively separate the Lang Syne groundwater contamination into its own manageable unit designated OT-16C (OU-2C). Contaminated groundwater from the OT-16C area (approximately 34.4 acres) was to be captured and monitored at Operable Unit 1 (OU-1), should the contamination migrate that far. SCDHEC approval of the final CMS for OT-16C was finalized in the RCRA permit modification effective 29 June 2001. When the OU-1 treatment plant was decommissioned in 2007, SCDHEC indicated that a revised CMS would be required listing that the OU-1 system was removed as a component of the final remedy. The final CMS was submitted to SCDHEC for review in January 2010.

SD-23 refers to the four former OWSs located at Building 325 (Vehicle Maintenance Area). The units are concrete-lined, in-ground basins, ranging in size from approximately 3 to 11 feet long and 5 to 9 feet deep. The units collected wash water from the maintenance areas. The water was piped to go to the WWTP whereas the oil was collected and pumped out by vacuum truck monthly and taken to the used oil separator tank before off-site recycling. The OWSs were closed in-place in November 2002 under a base-wide compliance program initiative. SD-23 was closed on 7 June 2004.

SD-29 is a former spill site located between Building 1200 and Building 708, west of the flightline and parking apron. Two releases of JP-4 at SD-29 are known to have occurred. In January 1992, an OWS failed and approximately 50 gallons of JP-4 was released. In response, an estimated 80 tons of contaminated soil were removed and disposed of offsite. The second release occurred from a leaking 1,000 gallon underground storage tank (UST) located in the vicinity of Building 1202. The UST contained reclaimed JP-4. The UST was removed and an expanded assessment of the site was conducted to identify additional contaminant sources and to further define the extent of site contamination. Free-phase JP-4 was detected in groundwater at the site. A passive interim remedial action system was installed in March 1995 to recover the free- phase JP-4. On 1 March 2004, the SCDHEC approved discontinuing active product recovery, decommissioning the air stripper system and related operations and maintenance activities while maintaining passive bailers to recover free product. During operation, the interim remedial action recovered more than 731 gallons of free product and treated more than 6 million gallons of groundwater. Since 2004, all recoverable free product has been removed, the long-term monitoring program optimized and the treatment system removed. The Air Force has prepared a Corrective Measure Implementation work plan in accordance with the

groundwater mixing zone variance guidance and submitted the document to the SCDHEC in September 2009 for review and concurrence.

SS-35 is located near Buildings 1205 and 1200 along the flightline. The site was separated from SD-29 (and renamed SS-35 (OU-2D), since it is associated with TCE contamination commingled with the OT-16B (OU-2B) site. The contamination originating from SS-35 extends beneath base housing and has affected one base water well (BW-3). An air stripper was placed on BW-3 in approximately 1992 during a rapid response action. The Remedial Investigation/RCRA Facility Investigation delineated chlorinated solvents in both the Duplin Aquifer and the Upper Black Creek Aquifer. The Air Force implemented a remedy for the site consisting of four extraction wells and is piped to combine with the groundwater treatment plant for OT-16B/OU-2B site.

SS-36 was initially identified as TCE contamination found in base drinking well (BW)-5, located along the northern boundary of Shaw AFB, near Frierson Road. In December 2000, TCE concentrations below the maximum contaminant level were discovered in the well. The potential source area is unknown, but a surface aquifer source area was delineated, which underlies the north end of the runways as well as portions of the golf course and the housing area and extends downward into the Black Creek Aquifer. The site has been investigated; SCDHEC approved the RCRA Facility Investigation report in August 2009. The CMS is currently in development to evaluate the appropriate site remedy.

ST-24 refers to the Building 325 (Vehicle Maintenance Area) Oil Accumulation Tank. It was an aboveground storage tank with a capacity of approximately 500 gallons, underlain by concrete and surrounded by a block wall for protection and spill containment. The used oil was removed monthly by vacuum truck and disposed off site. There is no apparent soil or groundwater contamination associated with this site. Both the SCDHEC and USEPA agreed to close the site on 18 February 1996 with the final permit modification completed 29 June 2001.

ST-27 refers to a former 1,000-gallon No. 2 heating oil UST located adjacent to Building 1128. During a leak detection test in August 1990, the UST was found to be leaking. In June 1993, the Air Force completed a Site Investigation in which soil samples were collected at depths of 15, 20 and 29 feet below ground surface. Measurable concentrations of Diesel-Range-Organics (DRO) were detected in the 15 and 20 foot samples; no detectable concentrations of DRO were measured in the 29 foot sample. The Site Investigation report concluded that impacts to soils appeared to be limited vertically and did not extend to the water table. One groundwater monitoring well was installed in June 1994. Soil and groundwater analyses from the monitoring well revealed no detectable DRO concentrations. Based on those results, the site was closed on 14 August 1995.

Site WP-12 is the former Land Spreading Sludge Area located along the southern edge of the base. Between 1976 and May 1992, approximately 280 tons of dried and liquid sludge were applied to the land surface annually. The land applications ceased in May 1992. Soil and composite sludge samples indicated concentrations of contaminants at levels typical of background concentrations. Soils underlying the sludge contained no detectable amounts of

contaminants, therefore, no groundwater contamination was evident and no monitoring wells were installed. The Air Force recommended no further action at the site in 1993 with subsequent SCDHEC and USEPA approval by 1995. The site was closed on 9 July 1999.

3.9 SAFETY

3.9.1 Definition of the Resource

Ground and flight safety involving aviation operations conducted by the 20 FW are addressed in this section. Because of the proposal to construct within portions of the airfield environment, the focus of this section is on safety-of-flight issues associated with airfield operations. Within the *ground safety* section, issues involving operations and maintenance activities that support operation of the airfield are addressed. Also considered in this section is the safety of personnel and facilities on the ground that may be placed at risk from flight operations. Within the *flight safety* section, aircraft flight risks and safety issues associated with the conduct of aviation activities at the installation are addressed.

Although ground and flight safety are addressed independently, it should be noted that, in the immediate vicinity of the runway, risks associated with safety-of-flight issues are interrelated with ground safety concerns. Any aircraft accident at the airfield would have direct impacts on the ground in the immediate vicinity of the mishap as a result of explosion, fire and debris spread. The ROI for safety in this EA includes Shaw AFB.

3.9.2 Existing Conditions

GROUND SAFETY

Ground safety includes safety as it pertains to construction and demolition, airfield operations and potential accident zones as well as force protection. Air Force day-to-day operations and maintenance activities completed by the 20 FW and its tenants in the use and operation of the airfield are performed in accordance with applicable Air Force and ACC safety regulations, published Air Force Technical Orders and standards prescribed by Air Force Occupational Safety and Health requirements.

CZs and APZs are surface areas, described geographically on the ground. Specific dimensions, geophysical and topographic standards and approved land uses are discussed in detail in UFC 3-260-01, *Airfield and Heliport Planning and Design*; AFI 32-7063, *The AICUZ Program*; and AFH *32-7084, AICUZ Program Manager's Handbook*. The Air Force has conducted several studies over many years assessing aircraft accidents occurring in the vicinity of airfields to support the definition of CZs and APZs. The studies show that approximately 27 percent of the accidents occurred on or within an area 1,000 feet on either side of the runway; approximately 29 percent occurred within 3,000 feet from the end of the runway and 1,500 feet on either side of the extended runway centerline. Extending the 3,000-foot-wide region another 5,000 feet accounted for an additional 18 percent of the accidents and further extending it 7,000 feet accounted for an

additional 5 percent. Shaw AFB's CZs and APZs are displayed in Figures 3.9-1 and 3.9-2 as related to the Proposed Action and Alternative 1.

The CZ is basically a square that is 3,000 feet long and 3,000 feet wide at both ends of the runway. It extends 3,000 feet out from each end of Shaw's two (parallel) runways and 1,500 feet to either side of the extended runway centerlines. Land uses in the CZ are severely restricted and aboveground structures and utility lines are normally not allowed. Within the CZ, an area extending 1,000 feet from the runway and 500 feet to either side of the extended runway centerline is designated as the graded area. The graded area must be cleared of brush and trees and free of abrupt surface irregularities, ditches and ponding areas. In the CZ outside of the graded area, brush and trees are allowed. However, they may not penetrate the airfield imaginary surfaces, which are discussed in the section titled "Flight Safety" below.

AFI 32-7063, *The Air Installation Compatible Use Zone Program,* states that the Air Force shall acquire a real property interest over all land within the CZs whenever practicable. Currently, the Air Force has not acquired a real estate interest in a strip of land approximately 500 feet wide that runs along the western edge of the northern CZ. However, negotiations are currently under way for the Air Force to purchase this land.

APZ I is less critical than the CZ, but still poses significant potential for accidents. This 3,000 foot-wide by 5,000 foot-long area located just beyond the CZ, has land use compatibility guidelines that allow a variety of industrial, manufacturing, transportation, communication, utilities, wholesale trade, open space, and agricultural uses. Uses that concentrate people in small areas are not compatible.

APZ II is less critical than APZ I, but still poses potential for accidents. APZ II is 3,000 feet wide and extends 7,000 feet beyond APZ I. Compatible land uses include those of APZ I, as well as low density single family residential, and those personal and business services and commercial retail trade uses with low intensity or scale of operation. High density functions such as multistory buildings, places of assembly (e.g., theaters, schools, churches, and restaurants) and high density office uses are not considered compatible.

AT/FP is a security program designed to protect Air Force active duty personnel, civilian employees, family members, facilities and equipment, in all locations and situations. The program is accomplished through the planned and integrated application of anti-terrorism measures, physical security, operations security and personal protective services. It is supported by intelligence, counterintelligence and other security programs. In response to terrorist attacks, several regulations have been promulgated to ensure that force protection standards are incorporated into the planning, programming and budgeting for the design and construction of Military Construction-funded facilities. UFC 04-010-01, *DoD Minimum Antiterrorism Standards for Buildings* (published in 2003 and updated in 2007) establishes minimum standoff distances that must be maintained between several categories of structures and areas that are relatively accessible to terrorists.

Force protection at Shaw AFB is also maintained through the use of entry control points. Personal vehicles enter and exit the base through four active security checkpoints: the Main Gate on Shaw Drive, the Frierson Street Gate, the North Gate on Frierson Road and the commercial gate off U.S. Highway 76/378. The commercial gate is used as an inspection point for commercial vehicles entering the installation. Existing gate facilities are inadequate in several respects. The Main Gate on Shaw Drive is located adjacent to an off-base wooded area to the west and does not provide adequate space for search and inspection of suspected vehicles. The current location of the Main Gate also causes traffic to back up onto U.S. Highway 76/378, increasing the potential for vehicle accidents. Relocation of the Main Gate to address the problems listed above was analyzed for environmental impacts under the 2004 *Wing Infrastructure Development Outlook (WINDO) EA* and found to have no significant impacts (Air Force 2004a).

Several facilities in the northern portion of Shaw AFB are currently not in compliance with AT/FP standards in that they are too close to publicly-accessible, off-base areas. In order to provide the required level of protection, the Air Force must control access to these areas through fences, gates and other security measures.

FLIGHT SAFETY

As with ground safety, day-to-day flying operations are accomplished by highly trained and qualified flight crews in accordance with detailed operational procedures. Since takeoff and landing operations constitute the most critical phases of flight, there are numerous requirements applicable to the airspace through which an aircraft flies during these operations.

These requirements focus on the configuration of the airspace which extends from the end of the runway and is best described as a plane which rises on given gradients forming a floor, or an imaginary surface for the airspace used during these operations.

UFC 3-260-01 defines and describes these imaginary surfaces. The imaginary surfaces of concern in this assessment are referred to as the approach/departure slope and the transitional surface slope. The approach/departure slope rises at a rate of 40:1, starting 200 feet from the end of the runway. The transitional surface is an imaginary surface that extends outward and upward at right angles to the runway centerline and extended runway centerline at a slope ratio of 7:1 (for every 7 feet horizontally there can be a 1-foot increase vertically). The transitional surface connects the primary and the approach/departure clearance surfaces to the inner horizontal, the conical and the outer horizontal surfaces. UFC 3-260-01 dictates that the vertical height of vegetation and other fixed or mobile obstacles (such as construction equipment) will not penetrate the transitional surface to be compatible. At Shaw AFB, there are 12 obstacles waived, 24 deviations and 13 exempt items (Air Force 2009b).

EXPLOSIVES SAFETY

The 20 FW controls, maintains and stores all ordnance and munitions required for mission performance. Ordnance is handled and stored in accordance with Air Force explosive safety directives (AFM 91-201) and all munitions maintenance is carried out by trained, qualified personnel. Ample storage facilities exist and all facilities are fully licensed for the ordnance they store. No storage facility waivers are currently in effect.

Safety clearance zones protect areas where munitions are stored, maintained and handled. These zones are geographically defined as Q-D arcs and are based on the types and amounts of explosive material involved. The 20 FW has constructed nine facilities where a variety of munitions are stored or handled. The 20 FW Safety Office has established Q-D arcs based on the types and amounts of explosives to be stored at each location (Table 3.9-1). The arcs shown in Figures 3.9-1 and 3.9-2 are a result of munitions storage and handling at the locations identified in Table 3.9-1. Construction of inhabited buildings within Shaw AFB Q-D arcs is limited only to those facilities whose function is directly related to explosives operations (AFM 91-201). Due to proximity to the installation boundary, one safety arc in the munitions storage area extends off the east side of the installation. However, no waiver is required because the Air Force has established easements with the property owner to ensure protection of the area (Air Force 2002).

Table 3.9–1. Quantity-Distance Arcs

Location	*Radius (feet)*
Building 1803	1,250
Building 1815	1,250
Building 1816	1,250
Building 1824	2,115
Building 1870	1,250
Hot Cargo Pad	1,400
EOD Range	500
All Aircraft	
Parking Ramps	400
Runway 04R/22L	1,400

Source: Air Force 2004a

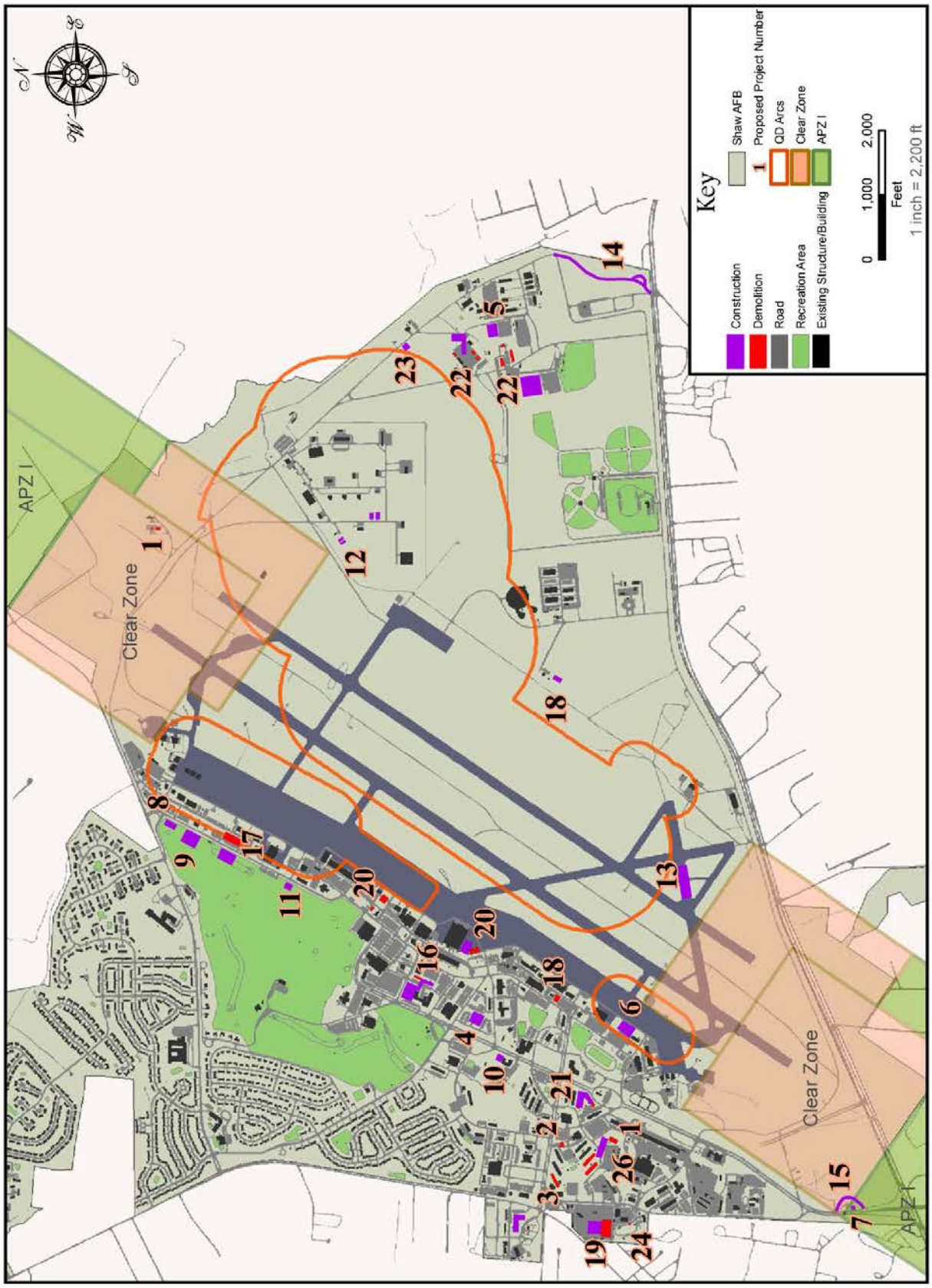


Figure 3.9-1. Safety Constraints at Shaw AFB under the Proposed Action

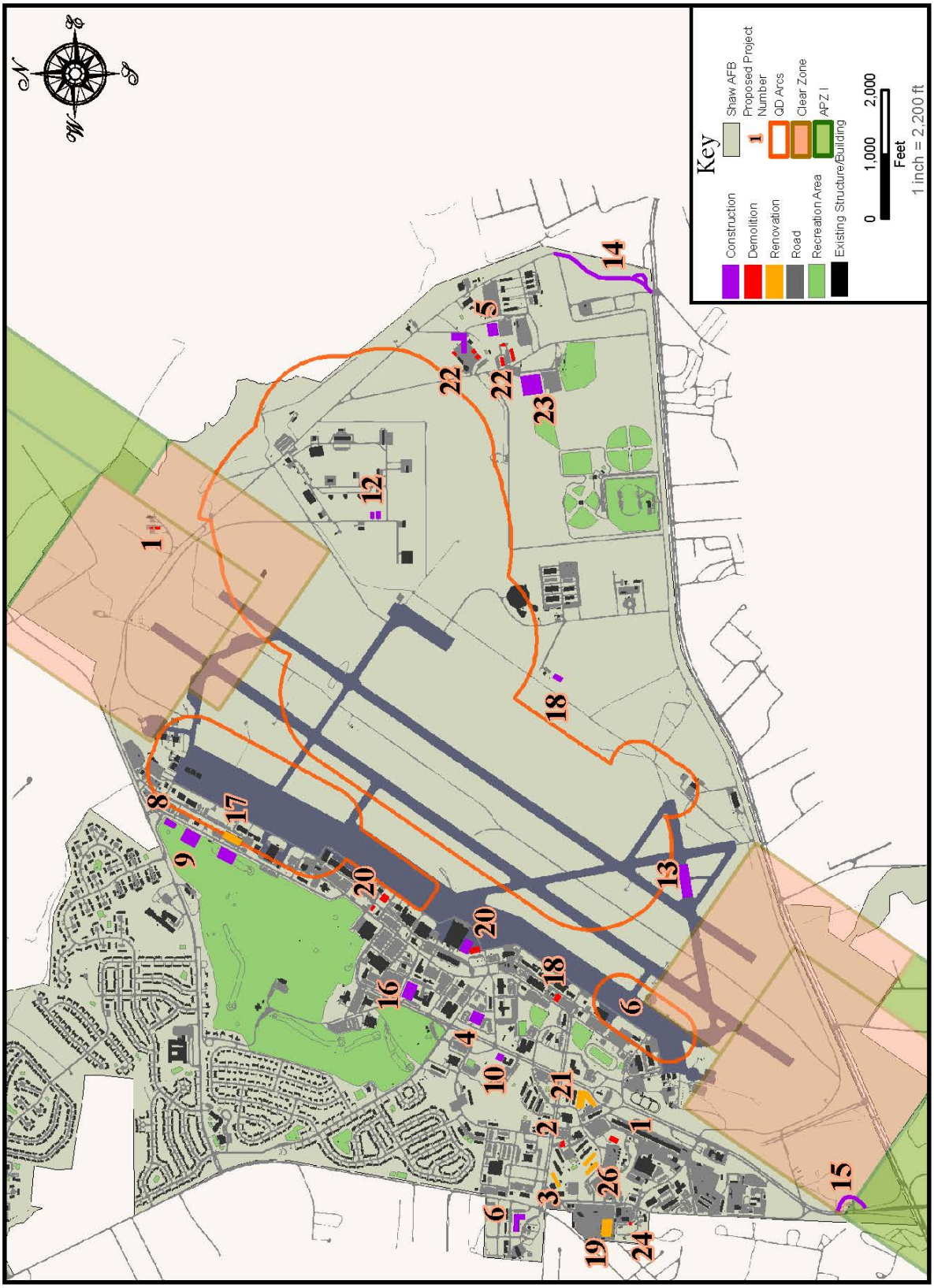


Figure 3.9-2. Safety Constraints at Shaw AFB under Alternative 1

3.10 NOISE

3.10.1 Definition of the Resource

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human response to noise varies according to the type and characteristics of the source, distance between source and receptor, receptor sensitivity and time of day. The ROI for noise includes the area surrounding each project location that may be affected by construction noise and noise from on-going operations.

Sound is measured with instruments that record instantaneous sound levels in decibels (dB). A-weighted sound level measurements (often denoted dBA) are used to characterize sound levels that are heard especially well by the human ear. All sound levels analyzed in this EA are A-weighted; thus, the term dB implies dBA unless otherwise noted. Because noise levels at a given location typically change constantly over the course of a day, time-averaged noise metrics are often used to describe the general noise environment. Because the same level of noise is more intrusive at night than it would be during the day, the Air Force uses the Day-Night Average Sound Level (L_{dn} or DNL) to describe noise. The L_{dn} averages the sound energy from aircraft operations over a 24-hour period and assigns an additional 10-dB penalty to noises that occur between 10 p.m. and 7 a.m.

3.10.2 Existing Conditions

At Shaw AFB, noise contributions from aircraft flying operations and ground engine run-ups have been calculated using the NOISEMAP model, which is the standard noise estimation methodology used for military airfields. NOISEMAP uses the following data to develop noise contours: aircraft types, runway utilization patterns, engine power settings, airspeeds, altitude profiles, flight track locations, number of operations per flight track, engine run-ups and time of day. The most recent update of noise data at Shaw AFB took place in February 2004 (Air Force 2007d) and noise contours generated during this data collection are displayed in Figure 3.10-1 and Figure 3.10-2.

The AICUZ Program was developed to protect local citizens from the noise exposure and accident potential associated with flying activities and to prevent degradation of the Air Force's capability to achieve its mission by promoting compatible land use planning. Facilities on Air Force installations are sited compatibly with AICUZ recommendations whenever it is practicable to do so. According to AFH 32-7084, "governmental services" are compatible with noise levels up to 69 dB DNL and compatible with noise levels of up to 74 dB DNL if special noise attenuation measures are installed. Land uses categorized as "cultural activities" are compatible with noise levels up to 74 dB DNL only with special noise attenuation. "Miscellaneous manufacturing" and "highway and street right-of-way" land uses are compatible at any noise level; special noise attenuation measures are recommended only in noise-sensitive portions of facilities. About 85 percent of Shaw AFB is located within the 65 dB DNL contour.

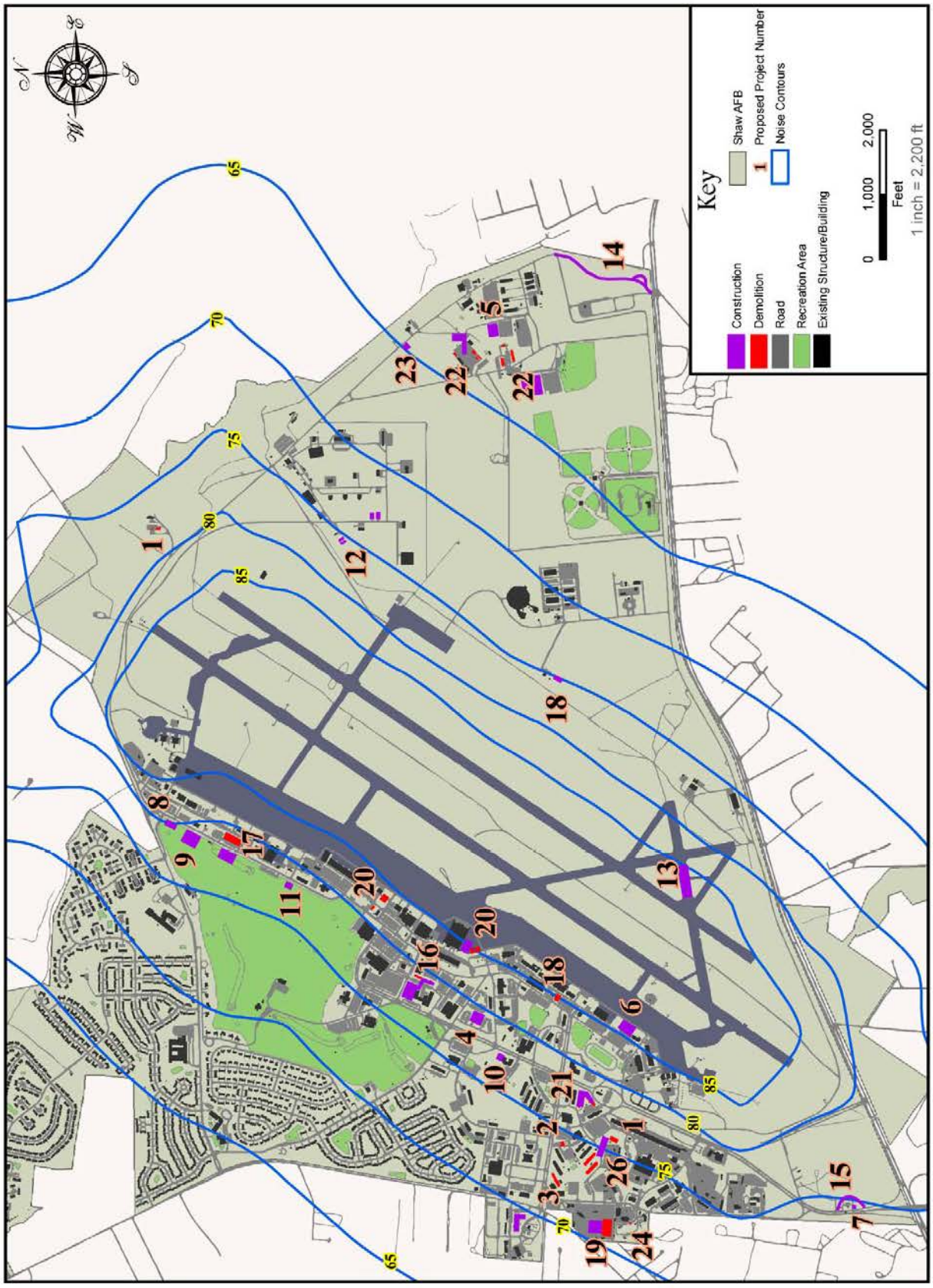


Figure 3.10-1. Noise Contours at Shaw AFB under the Proposed Action

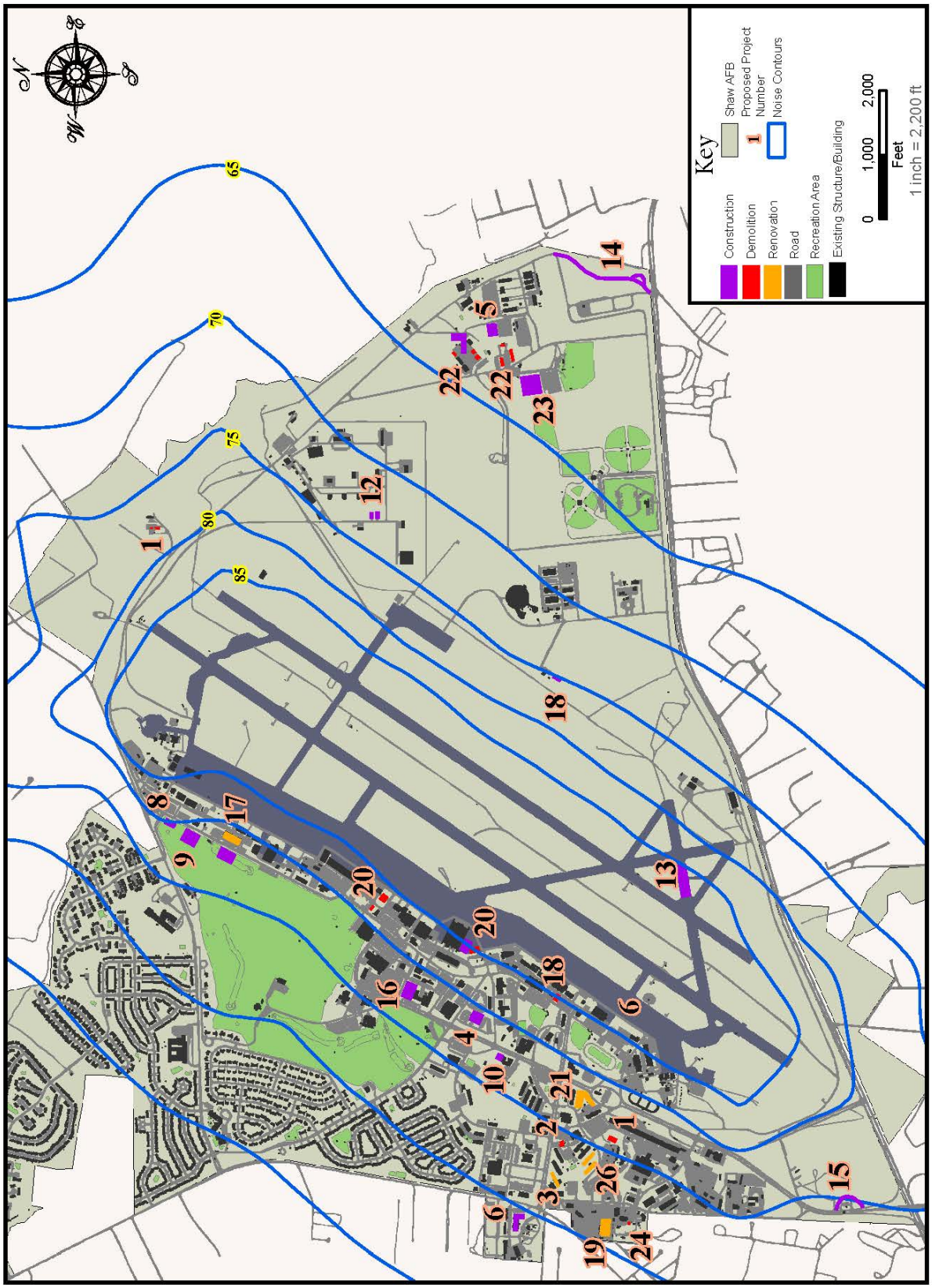


Figure 3.10-2. Noise Contours at Shaw AFB under Alternative 1

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4.0 ENVIRONMENTAL CONSEQUENCES

Chapter 4.0 presents the environmental consequences of the implementation of the CIP. To define potential direct and indirect impacts, this chapter evaluates the project elements described in Chapter 2.0 against each of the resource areas discussed in Chapter 3.0. Cumulative effects of the Proposed Action with other foreseeable future actions are presented in Chapter 5.0.

Environmental impacts are discussed for all components of the Proposed Action and locations of the CIP. Each resource area also contains discussion of Alternative 1. Under Alternative 1, components of the CIP would occur in alternative locations.

4.1 LAND USE RESOURCES

The methodology to assess impacts on individual land uses requires identifying those uses, as well as those affected land use planning and control policies and regulations, and determining the degree to which they would be affected by the proposal. Similarly, recreation and visual impacts are assessed by determining how, and to what extent, the Proposed Action and Alternative 1 would affect recreational opportunities and the overall visual character of the area. Traffic service is measured in terms of LOS related to potential delays. LOS is ranked from A to F with A representing the most desirable conditions with the free-flow movement of traffic and delays of less than 10 seconds. LOS E and F are generally unacceptable indicating severely congested conditions with delays of 50 seconds or more.

4.1.1 Proposed Action

LAND USE

It is not anticipated that implementation of the Proposed Action would result in any significant impacts to either on base or off base land uses. The proposal would not result in any changes to 20 FW operations, personnel levels, or land use. The Proposed Action is intended to correct existing land use issues and improve the functionality of the base and related mission functions through the implementation of the CIP. The proposed construction projects are the result of a coordinated land use planning process and take into account facility siting issues such as adjacent land uses both on and off base, the noise environment and airfield safety criteria.

One of the proposed projects would improve land use by eliminating an incompatible land use situation. Buildings 1707 and 1708 are currently located in the CZ in violation of the UFC airfield clearance criteria. The demolition of these two buildings would eliminate the issue. One facility, a visitors' center, is proposed for construction near the Main Gate in order to personnel and visitors to gain base passes prior to entering the base. However, this facility would be constructed within APZ I and would represent an incompatible land use. Overall, proposed projects to expand existing facilities or relocate facilities would improve land use by

collocating related mission functions and facilities into the same or adjacent facilities as well as moving facilities onto the base proper. The proposed demolition of outdated facilities would also improve land use by providing opportunities for growth and future development. It is anticipated that most of the projects would improve existing land uses however, the construction of the visitors' center in APZ I would be an incompatible land use. Therefore potential impacts to base land use would not be significant.

RECREATION

Recreation facilities on Shaw AFB would not be affected by the implementation of the Proposed Action. Proposed projects at the Wateree Recreation Area would improve recreation by expanding recreational opportunities for military personnel with additional RV parking, a new bath house and a new operations center. The addition of these facilities would not constitute a change in land use and would not preclude other land uses in the area. Therefore, it is anticipated that the Wateree Recreation Area projects would result in minor positive impacts to recreation that would not be significant.

VISUAL RESOURCES

With regard to visual resources, the construction and renovation projects in the Proposed Action would be visually consistent with the surrounding functions. Areas surrounding administrative functions away from the flightline would be landscaped. Projects in the Wateree Recreation Area were sited so as to minimize disturbance to the natural environment of the surrounding landscape in order to preserve the visual appeal of the recreation area. Therefore, significant impacts to visual resources are not anticipated.

TRANSPORTATION

It is expected that the proposed gate and road improvements in the Proposed Action would result in a beneficial impact to traffic conditions on Shaw AFB. The improvements at the Main Gate would alleviate traffic backups onto U.S. Highway 76/378 by moving the queue during peak traffic times further into the base without the traffic flowing into the main traffic flows on U.S. Highway 76/378. In addition, adding a privately-owned vehicle gate at the commercial gate would alleviate traffic at the Main Gate by allowing direct access to individuals traveling to the east side of the base. These individuals would be able to enter and exit through the new gate without using the Main Gate or the congested roadways on the west side of the base. However, there is the potential that the addition of the new gate would delay traffic on U.S. Highway 76/378 by adding a traffic signal at the gate's intersection. With the proposed gate and road improvements, the January 2009 traffic study estimates that LOS at each of the intersections would improve to LOS B, an acceptable LOS. Therefore, the proposed gate and road projects would improve traffic conditions on the base resulting in a beneficial but not significant impact.

4.1.2 Alternative 1

LAND USE

Potential land use impacts under Alternative 1 would be similar to those potential impacts discussed under the Proposed Action in Section 4.1.1. It is not anticipated that the implementation of Alternative 1 would result in any significant impacts to land use. The projects are intended and sited to improve land use on the base by consolidating similar mission functions into the same or adjacent facilities. The demolition of out-dated facilities, such as the heat plant facility (Building 403), would provide more opportunities for future development that would be more consistent with existing land uses. However, under Alternative 1, the renovation of facilities could result in constraining future development and mission synergies. This lack of land use flexibility for future development could be considered a negative impact on land use; however, it would not be considered significant.

RECREATION

Potential impacts to recreation would be the same as those discussed under the Proposed Action in Section 4.1.1. Constructing new RV parking sites as well as a new bath house and operations center at the Wateree Recreation Area would expand the capacity of the area to recreational users and provide additional services. It is anticipated that the projects would result in minor, positive impacts to recreation opportunities that would not be significant.

VISUAL RESOURCES

Potential impacts to visual resources would be the same as those discussed under the Proposed Action in Section 4.1.1. The design of the construction and renovation projects would be consistent with Shaw AFB's existing architectural and visual character. Facilities that are not located on the flightline would be landscaped. Projects proposed in the Wateree Recreation Area were sited so as to minimize disturbance to the surrounding natural environment and preserve the visual appeal of the area. Therefore, no significant impacts are anticipated to visual resources.

TRANSPORTATION

Under Alternative 1, all of the proposed gate and road projects would be the same as those described in the Proposed Action. Therefore, the proposed gate and road projects are expected to improve traffic conditions on the base and result in a beneficial but not significant impact.

4.1.3 No Action Alternative

Under the No Action Alternative, the projects identified in the CIP would not be implemented. Incompatible land uses would remain specifically the facilities located within the CZs in violation to the UFC airfield clearance criteria. Recreation would not be affected and no

additional services would be provided at the Wateree Recreation Area. Visual resources would not be affected. Transportation would not be improved and queuing would continue on U.S. Highway 76/378 during peak morning and evening hours.

4.2 INFRASTRUCTURE

Potential impacts to infrastructure elements at Shaw AFB are assessed in terms of effects of implementing projects in the CIP on existing service levels described in Section 3.2. Impacts to utilities are assessed with respect to the potential for disruption or improvement to utility systems, deterioration or improvement of existing levels of services. Utility system effects may include disruption, degradation, or improvement of existing levels of service or potential change in demand for energy or other utility services.

4.2.1 Proposed Action

No personnel changes are associated with the Proposed Action; therefore no effect on infrastructure demand related to an increase in personnel would occur.

ELECTRICAL DISTRIBUTION AND NATURAL GAS

Under the Proposed Action, a slight increase in electrical use is anticipated as a result of the construction of new facilities. New facilities would be constructed with more energy efficient design standards and utility systems. Shaw AFB currently uses approximately 61 percent of the total capacity of the electrical system during peak periods. For natural gas, Shaw AFB currently uses only 21.5 percent of the total capacity of the natural gas system. The increased load on the electrical system from the new facilities is not expected to exceed the total capacity of the electrical distribution system or the natural gas system. Therefore, no significant impacts to electrical distribution or natural gas systems are anticipated.

POTABLE WATER

The Proposed Action is not anticipated to significantly impact the availability of potable water on Shaw AFB. New construction would implement water conservation measures. Many of the projects are replacement construction and with the additional conservation measures the net change in potable water use is expected to be minimal. Shaw AFB currently uses up to half of the current capacity of the functional water wells. It is expected that the minimal increase in demand for potable water can be adequately met using existing potable water wells and sources. Therefore, no significant impacts to potable water are anticipated.

WASTEWATER

As with potable water, it is expected that the existing wastewater treatment infrastructure is adequate to meet an increase in wastewater flows. Many of the projects are replacement projects and therefore, the net change in wastewater flows are expected to be minimal.

Wastewater would continue to be treated at the on-base WWTP. The average daily flow is approximately 66 percent of the permit capacity of the WWTP. The capacity is generally only exceeded following periods of heavy rainfall. With the expected minimal increase in wastewater flows from the implementation of the Proposed Action it is expected that the existing wastewater system is adequate to meet the increase in flows. Therefore, no significant impacts to wastewater are anticipated.

SOLID WASTE

USEPA guidance provides estimates of the amount of solid waste materials generated by construction, renovation and demolition activities. Impacts to solid waste from the implementation of the CIP are based on an assumption that 3.89 pounds of construction/demolition debris would be generated per SF of floor area (USEPA 1998). Taking the projects into account as a whole, there is a total disturbance of over 1 million SF which would generate an estimated 2,592 tons of construction and demolition debris over the course of the entire project. Debris would be recycled to the extent possible and the remaining debris would be transported to the Sumter County C&D landfill. In 2003, a total of 8,230 tons of solid waste was generated by Shaw AFB and transported to off base landfills. The Sumter County C&D landfill is projected to reach capacity within 20 years. The extent of the C&D in the CIP are such that projects would be completed as funding became available; therefore, only a portion of the proposed projects would be in progress at any one time. Therefore, with the remaining capacity in the C&D landfill and the phased approach to the projects and debris generation, it is not expected that the Proposed Action would generate enough solid waste debris to result in a significant impact to the landfill.

COMMUNICATIONS SYSTEMS

The Proposed Action would not result in significant impacts to communication systems at Shaw AFB. New wiring and some reconfigurations of various communication systems would be conducted in accordance with the needs of the individual projects. Projects with specific communications requirements have been sited in order to use existing infrastructure. It is expected that all communication capacity needs will be met through planning and system improvements.

STORM DRAINAGE SYSTEM

Under the Proposed Action, the net change in impervious surface would be an increase of approximately 737,612 SF or 16.93 acres. This change in impervious surface would represent an increase of approximately 4.23 percent of Shaw AFB's total impervious surface. It is not expected that this minor increase in impervious surface would substantially increase the amount of stormwater runoff generated during storm events. In the course of the projects, none of the existing storm drainage systems would be affected by the construction or demolition of facilities. Therefore, no significant impacts are anticipated to the storm drainage system.

4.2.2 Alternative 1

No personnel changes are associated with the Proposed Action; therefore, no effect on infrastructure demand related to an increase in personnel would occur.

ELECTRICAL DISTRIBUTION AND NATURAL GAS

No significant impacts are anticipated to the electrical distribution or natural gas distribution systems as a result of Alternative 1. As described in Section 4.2.1, the projects included in Alternative 1 would be constructed within existing electrical and natural gas infrastructure. In addition, many of the projects include demolition and replacement of facilities resulting in only a minor increase in the demand for additional electrical or natural gas services. The current electrical distribution system operates up to 61 percent of capacity and the natural gas system operates up to 21.5 percent. With the minor increase in demand for each service, it is expected that the demand for these utilities can be met with the existing infrastructure. Therefore, no significant impacts are anticipated.

POTABLE WATER

As described in Section 4.2.1, there is no significant impact on potable water anticipated from implementation of the CIP projects. Many of the projects included in Alternative 1 are demolition and replacement construction. Therefore, it is not expected that the amount of potable water required would be substantially different from current levels. Shaw AFB currently uses up to half of the capacity of the functional wells. It is expected that the minimal increase in demand for potable water can be adequately met using existing potable water wells and sources. Therefore, no significant impacts to potable water are anticipated.

WASTEWATER

As with potable water, it is expected that the existing wastewater treatment infrastructure is adequate to meet an increase in wastewater flows. Under Alternative 1, many of the projects are replacement projects and therefore, the net change in wastewater flows are expected to be minimal. Wastewater would continue to be treated at the on-base WWTP. Shaw AFB currently uses up to 66 percent of the permit capacity and only exceeds that capacity during incidences of heavy rainfall. With the expected minimal increase in wastewater flows from the implementation of Alternative 1, it is expected that the existing wastewater system is adequate to meet the increase in flows. Therefore, no significant impacts to wastewater are anticipated.

SOLID WASTE

As described in Section 4.2.1, solid waste generation is estimated using the USEPA guidance assuming 3.89 pounds per SF of construction or demolition debris. Under Alternative 1, there is a total disturbance of 889,432 SF which would generate an estimated 1,730 tons of C&D debris over the course of the entire project. Debris would be recycled to the extent possible and the

remaining debris would be transported to the Sumter County C&D landfill. In 2003, a total of 8,230 tons of solid waste was generated by Shaw AFB and transported to off base landfills. The Sumter County C&D landfill is projected to reach capacity within 20 years. The extent of the C&D in the CIP are such that projects would be completed as funding became available; therefore, only a portion of the proposed projects would be in progress at any one time. Therefore, with the remaining capacity in the C&D landfill and the phased approach to the projects and debris generation, it is not expected that Alternative 1 would generate enough solid waste debris to result in a significant impact to the landfill.

COMMUNICATIONS SYSTEMS

Alternative 1 would not result in significant impacts to communication systems at Shaw AFB. New wiring and some reconfigurations of various communication systems would be conducted in accordance with the needs of the individual projects. Projects with specific communications requirements have been sited in order to use existing infrastructure. It is expected that all communication capacity needs will be met through planning and system improvements.

STORM DRAINAGE SYSTEM

Under Alternative 1, the proposed projects would add approximately 731,386 SF, or 16.79 acres, of impervious surface to the base. With a current total of 400 acres of impervious surface, the additional 16.79 acres would represent an increase of 4.20 percent in total impervious surface. As described in Section 4.2.1, this does not represent a substantial change in impervious surface and is unlikely to cause a substantial change in the amount of stormwater runoff. In addition, none of the projects would directly affect the storm drainage system or its capacity to adequately handle stormwater runoff. Therefore, no significant impacts are anticipated to the storm drainage system from the implementation of Alternative 1.

4.2.3 No Action Alternative

Under the No Action Alternative, the CIP projects would not be implemented and the 20 FW would continue to utilize existing facilities and infrastructure. No significant impacts are anticipated.

4.3 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

In order to assess the potential socioeconomic impacts of the Proposed Action and Alternative 1, demographic and economic characteristics at Shaw AFB and Sumter County were analyzed, as presented in Section 3.3. Potential socioeconomic consequences were assessed in terms of effects of the Proposed Action on the local economy, typically driven by changes in expenditure levels. For this EA, potential socioeconomic impacts are evaluated for factors associated with the construction expenditures related to the CIP.

Environmental justice analysis applies to adverse environmental impacts. The minority and low-income populations in the vicinity of Shaw AFB and in Sumter County were identified as presented in Section 3.3. Potential disproportionate impacts to minority and low-income populations are assessed only when adverse environmental consequences to the human population are anticipated, otherwise no additional analysis is required.

4.3.1 Proposed Action

Under the Proposed Action, the 20 FW would implement C&D projects associated with the CIP as described in Section 2.1. Additional construction expenditures would be expected to generate an increase in construction employment and income. However, these projects would be dispersed over a period of time as funding for each project becomes available. Therefore, it is not anticipated that the additional expenditures would be substantially more than the current FY 2009 construction expenditures of approximately $28 million. The new RV parking areas proposed at the Wateree Recreation Area may generate additional revenue for the 20 FW from military personnel renting the spaces. However, it is expected that the additional revenue would be minimal and allocated to the upkeep and maintenance of the Wateree Recreation Area. No permanent or long-lasting socioeconomic impacts are anticipated as a result of implementation of the Proposed Action. Minor temporary benefits may occur as workers from the surrounding area may be employed to implement the Proposed Action. However, no significant socioeconomic impacts are anticipated.

The Proposed Action is not expected to create significantly adverse environmental or health impacts as described in Section 3.8, *Hazardous Materials and Hazardous Waste*; Section 3.9, *Safety*; and Section 3.10, *Noise*. Consequently, no disproportionately high and adverse human health or environmental impacts to minority and/or low-income populations have been identified. In addition, there are no known environmental health or safety risks associated with the Proposed Action that may disproportionately affect children. The construction areas would be restricted, to effectively bar any person, including children, from unauthorized access. Therefore, no significant environmental justice impacts are anticipated from the implementation of the Proposed Action.

4.3.2 Alternative 1

The potential socioeconomic impacts from Alternative 1 would be similar to those identified for the Proposed Action in Section 4.3.1. Alternative 1 implements the same projects as identified in the Proposed Action with alternative locations or area of disturbance. Temporary impacts such as increased employment, particularly in the construction industry, would be anticipated. However, as the projects would be dispersed over a period of time, it is not expected that the impacts would generate any substantial sources of employment or additional economic activity. Therefore, no significant socioeconomic impacts are anticipated.

No adverse environmental impacts are anticipated from the implementation of Alternative 1 as described in Section 4.8.2, *Hazardous Materials and Hazardous Waste*; Section 4.9.2, *Safety*; or

Section 4.10.2, *Noise*. Therefore no disproportionate impacts are anticipated for minority or low-income populations. In addition, there are no known environmental health or safety risks associated with Alternative 1 that may disproportionately affect children. The construction areas would be restricted, to effectively bar any person, including children, from unauthorized access. Therefore, no significant environmental justice impacts are anticipated.

4.3.3 No Action Alternative

Under the No Action Alternative, the CIP projects as described in the Proposed Action and Alternative 1 would not be implemented. The 20 FW would continue to utilize the current facilities. The socioeconomic impact of Shaw AFB in the community would continue as described in Section 3.3 and no significant socioeconomic or environmental justice impacts are anticipated.

4.4 CULTURAL RESOURCES

Section 106 of the NHPA, as amended, requires federal agencies to account for the effects of proposed actions on historic properties. Historic properties are cultural resources that are listed in, or eligible for listing in, the NRHP. Eligibility evaluation is the process by which resources are assessed relative to NRHP significance criteria for scientific or historical research, for the general public and for traditional cultural groups. Impacts may be considered adverse if the identified resources are eligible for listing in the NRHP or are identified as important to American Indians as outlined in the American Indian Religious Freedom Act and EO 13007, *Indian Sacred Sites*.

Analysis of potential impacts to cultural resources considers the direct impacts that may occur by physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its setting; or neglecting the resource to the point that it deteriorates or is destroyed. Direct impacts can be assessed by identifying the types and locations of proposed activity and determining the exact location of the resource that could be affected. Indirect impacts generally occur as a result of increased use of the area in which a resource occurs.

4.4.1 Proposed Action

The Proposed Action consists of implementing several CIP projects including the demolition of 25 facilities, additions/alterations to 5 facilities and new construction of 18 facilities and associated parking areas. For all projects, compliance with Section 106 of the NHPA, including SHPO consultation, would take place prior to C&D activities. Several of the projects include ground-disturbing activities, where there is a possibility of encountering heretofore unknown archaeological artifacts. If artifacts are discovered during construction, Shaw AFB's Cultural Resources Manager, Conservation Chief and NEPA Coordinator would be contacted immediately. All activities at that location would stop until the site could be evaluated by a

professional archaeologist as outlined in the 20 FW *Integrated Cultural Resources Management Plan* (Air Force 2008a).

There are no historic districts, fields, areas, or landmarks at Shaw AFB. Of the installation's facility complement, only Building 611 is eligible for inclusion on the NRHP due to its Cold War significance (Air Force 2008a). None of the identified archaeological sites on Shaw AFB are eligible for listing on the NRHP. None of the CIP projects under the Proposed Action are located near Building 611; an NRHP-eligible archaeological site; or a non-NRHP archaeological site. Within that context, none of the activities in the Proposed Action should significantly impact the integrity of location, design, setting, materials, workmanship, feeling, or association of known cultural resources on Shaw AFB. An email to Shaw AFB's NEPA Coordinator dated January 14, 2010 from the South Carolina Department of Archives and History, a division of the SHPO, concurred with the Finding of No Significant Impact (FONSI) (Appendix A). Therefore, the risk of adverse impacts to cultural resources resulting from CIP projects, while not zero, is low and not significant.

4.4.2 Alternative 1

Effects from Alternative 1 would be similar to those under the Proposed Action. For all projects in Alternative 1, compliance with Section 106 of the NHPA, including SHPO consultation, would take place before the project breaks ground. Several of the projects include ground-disturbing activities, where there is a possibility of encountering heretofore unknown archaeological artifacts. If artifacts are discovered during project-related activities, Shaw AFB's Cultural Resources Manager, Conservation Chief and NEPA Coordinator would be contacted immediately. All activities at that location would stop until the site could be evaluated by a professional archaeologist as outlined in the 20 FW *Integrated Cultural Resources Management Plan* (Air Force 2008a).

4.4.3 No Action Alternative

Under the No Action Alternative, CIP construction projects would not take place as proposed and impacts to cultural resources would not be expected. Cultural resource management would continue as described in the 20 FW *Integrated Cultural Resources Management Plan*.

4.5 BIOLOGICAL RESOURCES

Evaluation of impacts for biological resources is based upon the importance (legal, commercial, recreational, ecological, or scientific) of the resource; the rarity of the species or habitat regionally; the sensitivity of the resource to proposed activities; and the duration of the impact. Impacts to biological resources are considered to be greater if priority species or habitats are adversely affected over relatively large areas and/or disturbances cause reductions in population size or distribution of a priority species.

4.5.1 Proposed Action

The proposed projects would not result in a significant impact to terrestrial communities due to C&D occurring in previously developed and or maintained grass areas. Impacts in these areas are expected to be limited to displacement of members of commonly occurring species. At Wateree Recreation Area, no impacts to biological resources are anticipated beyond displacement of commonly occurring species (non-game species such as rabbit and squirrel) due the area's small size, elevated human presence and lack of habitat suitable for most game species.

The Proposed Action would not be expected to affect wetlands and aquatic communities provided Best Management Practices (BMPs) for sediment control, construction, beneficial landscaping and similar measures are utilized.

Threatened and endangered species and their critical habitat are not found in the project areas. The only special status species in the vicinity is the least tern which is a state threatened species. The least tern is known to nest on the roof of the BX in late spring and early summer. None of the projects in the Proposed Action would directly affect the BX. A letter from USFWS to Shaw AFB dated January 6, 2010 indicated no comments on the proposed projects (Appendix A). Therefore, no impacts to threatened and endangered species are expected.

4.5.2 Alternative 1

CIP projects under Alternative 1 would occur in previously developed and or maintained grass areas. Employing a similar reasoning, the impacts to biological resources under Alternative 1 are expected to be similar to those under the Proposed Action.

4.5.3 No Action Alternative

The No Action Alternative would involve no changes to current operations and would not result in any impacts to biological resources.

4.6 WATER RESOURCES

Land development changes the physical, chemical and biological conditions of water resources. When land is developed, the hydrology, or the natural cycle of water, can be altered. Impacts on hydrology can result from land clearing activities, disruption of the soil profile, loss of vegetation, introduction of pollutants, new impervious surfaces and an increased rate or volume of runoff after major storm events. Without proper management controls, these actions can adversely impact the quality and/or quantity of water resources.

Criteria for evaluating impacts related to water resources are water availability, water quality and adherence to applicable regulations. Impacts are measured by the potential to reduce water availability to existing users, endanger public health or safety by creating or worsening health hazards or safety conditions, or violate laws or regulations adopted to protect or manage water

resources. An impact to water resources would be significant if it would reduce water availability to, or interfere with the supply of, existing users; create or contribute to overdraft of groundwater basins or exceed safe annual yield of water supply sources; adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions; threaten or damage unique hydrologic characteristics; or violate established laws or regulations that have been adopted to protect or manage water resources of an area.

4.6.1 Proposed Action

Execution of the Proposed Action would result in additional areas becoming developed and impermeable to water which would, in turn, lead to increased quantities of stormwater runoff. The Proposed Action also involves demolition of several facilities. It is assumed that structures would be removed entirely when demolished, leaving a permeable, stabilized surface. Under the Proposed Action, 23.76 acres of impervious surface would be added and 6.83 acres would be removed producing a net increase of 16.93 acres. The square footage of all structures proposed to be constructed or demolished and the net change in total square footage of impermeable surface is listed in Table 4.6-1.

Prior to the start of construction, silt fences, storm drain inlet and outlet protection and other appropriate standard construction practices would be instituted in accordance with the Shaw AFB SWPPP (Air Force 2007e). For projects expected to disturb more than one acre, a South Carolina Pollutant Discharge Elimination System (SCPDES) Stormwater General Permit would be required. The construction contractor(s) would obtain that permit and provide a SWPPP that describes standard construction practices they will implement to eliminate or reduce sediment and non-storm water discharges. If the project-specific SWPPPs and standard practices are successfully implemented and monitored, the environmental consequences from erosion and sedimentation would be negligible.

No anticipated increase in groundwater usage is expected to occur by implementing the Proposed Action. The Shaw CIP involves no new mission beddowns and no direct augmentation of the civilian or military workforce. With the system operating at 54 percent of capacity, there would be available capacity to meet any incidental or indirect demand increase associated with the components of the proposed action.

There would be no significant impacts to water resources from point source or non-point sources with implementation of the Proposed Action. Under the Proposed Action, no construction would occur within the 100-year floodplain. Therefore, no impacts related to the 100-year floodplain are anticipated for the CIP projects.

Table 4.6–1. Areas of Impermeable Surfaces Resulting from Proposed Action (Page 1 of 2)

Project Number	*Project Activity/Description*	*Impervious Surface Added (SF)*	*Impervious Surface Removed (SF)*	*Net Change (SF)*
Demolition				
VLSB070097	Demolish Building 403 Heat Plant	0	4,640	-4,640
VLSB090027	Demolish Wastewater Treatment Plant (WWTP) Chlorine Chambers	0	1,586	-1,586
VLSB090055	Demolish Building 400 Airman Leadership School	0	27,904	-27,904
VLSB023004	Demolish Base Engineer Facilities, Buildings 218, 1707 and 1708.	0	14,300	-14,300
Expansion and New Construction				
VLSB993003	Expand Building 1109 Communications Facility	33,154	0	33,154
VLSB073001	Construct United States Air Forces Central Command (USAFCENT) Operations Facility	30,800	0	30,800
VLSB043004	Construct Field Training Detachment Aircraft Maintenance Training Facility	39,600	0	39,600
VLSB090054	Construct Visitor's Center	2,750	0	2,750
VLSB080066	Construct Fire Satellite Station	16,500	0	16,500
VLSB043002	Construct New Operations Group/Maintenance Group Facility	55,000	0	55,000
VLSB053002	Expand Building 912, Chapel	11,000	0	11,000
VLSB113004	Construct Aircraft Maintenance Mobility Equipment/Storage Facility	11,000	0	11,000
VLSB103003	Munitions Storage Magazine (2 igloos)	6,244	0	6,244
VLSB103004	Construct new Arm/De-arm pad	203,256	0	203,256
VLSB093013	Construct new gate on east side of base with necessary road improvements	110,256	0	110,256
VLSB090024b	Road realignment at Main Gate around Visitor's Center	72,000	0	72,000
VLSB105001	Construct Vehicle Storage Yard	86,625	0	86,625
VLSB065001	Wateree Recreation Area Improvements: Construct New Bath House and Update Septic System	3,194	0	3,194

Table 4.6-1. Areas of Impermeable Surfaces Resulting from Proposed Action (Page 2 of 2)

Project Number	*Project Activity/Description*	*Impervious Surface Added (SF)*	*Impervious Surface Removed (SF)*	*Net Change (SF)*
Construction and Related Demolition				
VLSB073002	Expand Headquarters (HQ) United States Air Forces Central Command (USAFCENT) Building 1130 and Demolish Building 1128 and 1129	55,000	10,439	44,561
VLSB093011	Demolish Building 1604 Existing Logistics Readiness Squadron Facility and Construct New Logistics Readiness Squadron Facility	47,630	33,000	14,630
VLSB093001	Demolish Building 700 and Construct New Radar Approach Control Facility	10,780	7,454	3,326
VLSB043006	Demolish and Replace with New Construction Building 325 Vehicle Maintenance Facility	44,000	42,141	1,859
VLSB113003	Demolish Buildings 1517, 1501, 1211 and 1212 and Construct New Armament Flight Maintenance and Storage Facility	27,500	25,590	1,910
VLSB093010	Demolish Buildings 430 and 428 and Replace with New Dormitory	59,732	49,327	10,405
VLSB983005	Demolish eight facilities and Construct 682nd Air Support Operations Squadron (ASOS) Complex.	49,500	25,453	24,047
VLSB 103002	Demolish Buildings 408 and 409 and construct new 144-person dormitory	59,732	55,807	3,925
	TOTAL	**1,035,253**	**297,641**	**737,612**

Notes: SF impervious surface was estimated as the total structure SF divided by number of floors.

4.6.2 Alternative 1

Under Alternative 1, impacts to water resources would be similar to the impacts under the Proposed Action. Under Alternative 1, 18.6 acres of impervious surface would be added and 1.81 acres removed producing a net increase in impervious surface of 16.79 acres. The square footage of all structures proposed to be constructed or demolished and the net change in total square footage of impermeable surface is listed in Table 4.6-2. Projects listed in shaded text are the alternative projects that differ from the Proposed Action. Measures taken to address stormwater runoff under Alternative 1 would be similar to those implemented under the Proposed Action producing a similar beneficial effect. Also, under Alternative 1, no construction would occur within a floodplain.

Table 4.6–2. Areas of Impermeable Surfaces Resulting from Alternative 1
(Page 1 of 2)

Project Number	*Project Activity/Description*	*Impervious Surface Added (SF)*	*Impervious Surface Removed (SF)*	*Net Change (SF)*
Demolition				
VLSB070097	Demolish Building 403 Heat Plant	0	4,640	-4,640
VLSB090027	Demolish Wastewater Treatment Plant (WWTP) Chlorine Chambers	0	1,586	-1,586
VLSB023004	Demolish Base Engineer Facilities, Buildings 218, 1707 and 1708.	0	14,300	-14,300
Expansion and New Construction				
VLSB090055	Renovate Airman Leadership School Building 400	0	0	0
VLSB993003	Expand Building 1109 Communications Facility	33,154	0	33,154
VLSB073001	Construct United States Air Forces Central Command (USAFCENT) Operations Facility	30,800	0	30,800
VLSB043004	Construct Field Training Detachment Aircraft Maintenance Training Facility (off base)	39,600	0	39,600
VLSB080066	Construct Fire Satellite Station	16,500	0	16,500
VLSB043002	Construct new Operations Group/Maintenance Group Facility	55,000	0	55,000
VLSB053002	Expand Building 912, Chapel	11,000	0	11,000
VLSB103003	Expand Existing Munitions Storage Magazine (2 igloos)	6,244	0	6,244
VLSB103004	Construct new Arm/De-arm pad	203,256	0	203,256
VLSB093013	Construct new gate on east side of base with necessary road improvements	110,256	0	110,256
VLSB090024b	Road realignment at Main Gate around Visitor's Center	72,000	0	72,000
VLSB073002	Expand Headquarters (HQ) United States Air Forces Central Command (USAFCENT) Building 1130 to Northeast (do not demolish Building 1128 and 1129)	55,000	0	55,000

Table 4.6-2. Areas of Impermeable Surfaces Resulting from Alternative 1
(Page 2 of 2)

Project Number	*Project Activity/Description*	*Impervious Surface Added (SF)*	*Impervious Surface Removed (SF)*	*Net Change (SF)*
VLSB093011	Renovate Building 1604 Existing Logistics Readiness Squadron Facility	0	0	0
VLSB043006	Renovate Building 325 Vehicle Maintenance Facility	0	0	0
VLSB093010	Renovate Buildings 430 and 428	0	0	0
VLSB105001	Construct Vehicle Storage Yard near existing storage yard	86,625	0	86,625
VLSB103002	Renovate Buildings 408 and 409	0	0	0
VLSB065001	Wateree Recreation Area Improvements: construct New Bath House and update Septic System	3,194	0	3,194
Construction and Related Demolition				
VLSB093001	Demolish Building 700 and construct new Radar Approach Control facility.	10,780	7,454	3,326
VLSB113003	Demolish Buildings 1517, 1501, 1211 and 1212 and construct new Armament Flight Maintenance and Storage Facility	27,500	25,590	1,910
	TOTAL	**810,409**	**79,023**	**731,386**

4.6.3 No Action Alternative

Under the No Action Alternative, the CIP projects would not be implemented and water resources would not be impacted.

4.7 AIR QUALITY

This section discusses the potential impacts to air quality as a result of the Proposed Action. Emissions associated with construction, demolition and combustion emissions from worker commutes would be the main contributors to air quality effects.

The evaluation uses the Air Force Air Conformity Applicability Model (ACAM) to determine if the Proposed Action would exceed the established 10 percent criterion for the ROI's emissions on an individual pollutant basis. A threshold of individual pollutant emissions not exceeding 10 percent of the total ROI emissions for each pollutant was selected for evaluating significance of the impacts associated with the Proposed Action. Although a conformity determination is

not required since Sumter County is designated "attainment," the ACAM provides a level of consistency with respect to emissions factors and calculations. Specific details regarding the assumptions and calculations associated with the emissions estimates are in Appendix A.

4.7.1 Proposed Action

The Proposed Action would include grading and structure construction operations as well as construction worker trips and stationary equipment (e.g., generators and saws), mobile equipment and architectural coatings for work associated with the construction of the new facilities. Likewise, the Proposed Action would include demolition of various existing facilities. The particular design and location of the facilities may evolve as the projects move forward, but the ACAM analysis uses square footage or acreage to determine the estimated emissions from construction and demolition projects. As discussed in Section 2.2, areas of disturbance (both C&D) were estimated to be 10 percent larger than the building footprint to allow for staging of vehicles and equipment. This provides a conservative analysis and allows for flexibility in architectural design specifics when the project has matured to that stage.

As indicated in Table 4.7-1, the individual pollutant emissions from the Proposed Action (total emissions including facility construction emissions and commuter mobile emissions) would not exceed 10 percent of the total ROI's emissions for each corresponding pollutant.

The highest pollutant percentage is nitrogen oxide (NO_x), which is approximately 3.30 percent of the ROI's total NO_x emissions based on the USEPA 2002 NEI. Therefore, there would be no significant impacts to air quality associated with implementation of the Proposed Action at Shaw AFB.

Table 4.7–1. Proposed Action Emissions

	CRITERIA POLLUTANT					
	CO	***NO_x***	***VOC***	***SO_2***	***PM_{10}***	***$PM_{2.5}$***
Proposed Action	431	141	29	17	53	0
Sumter County (ROI)	33,886	4,275	7,219	884	30,030	1,555
Percent of ROI	**1.27**	**3.30**	**0.40**	**1.92**	**0.18**	**0.00**

CO = carbon monoxide; NO_x = nitrogen oxides; VOC = volatile organic compounds; SO_2 = sulfur dioxide; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 10 microns in diameter.

C&D activities associated with the Shaw CIP will generate small amounts of GHGs, primarily from emission products from internal combustion engines. However, these amounts are negligible and would not significantly contribute to GHGs. The Bureau of Air Quality of the SCDHEC has recommended that Shaw AFB and its contractors comply with the following BMPs to the extent practicable: utilize ultra-low sulfur diesel or other alternative fuels; utilize emission controls applicable to C&D equipment; and reduce idling time on equipment (Appendix A). C&D activities are not likely to significantly affect the climate on a global or regional scale.

4.7.2 Alternative 1

Under Alternative 1, almost all of the projects under the Proposed Action would still be implemented at Shaw AFB. However, several of the projects would be relocated to alternate locations on the base (Table 2.3-1). In some cases, renovation will be implemented rather than C&D. All of the actions would still be conducted within Sumter County, which is the ROI.

As indicated in Table 4.7-2, the individual pollutant emissions from Alternative 1 (total emissions including facility construction emissions and commuter mobile emissions) would not exceed 10 percent of the total ROI's emissions for each corresponding pollutant.

The highest pollutant percentage is NO_x, which is approximately 2.60 percent of the ROI's total NO_x emissions based on the USEPA 2002 NEI. Therefore, there would be no significant impacts to air quality associated with implementation of Alternative 1 at Shaw AFB.

Table 4.7–2. Alternative 1 Emissions

	CRITERIA POLLUTANT					
	CO	***NO_x***	***VOC***	***SO_2***	***PM_{10}***	***$PM_{2.5}$***
Proposed Action	339	111	23	13	44	0
Sumter County (ROI)	33,886	4,275	7,219	884	30,030	1,555
Percent of ROI	**1.00**	**2.60**	**0.32**	**1.47**	**0.15**	**0.00**

CO = carbon monoxide; NO_x = nitrogen oxides; VOC = volatile organic compounds; SO_2 = sulfur dioxide; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 10 microns in diameter.

As discussed in Section 4.7.1, C&D activities under Alternative 1 would generate small amounts of GHGs as a result of emissions from combustion engines. However, these amounts are negligible and would not significantly contribute to GHGs. As described under the Proposed Action, by recommendation of the Bureau of Air Quality of SCDHEC, Shaw AFB and its contractors would comply with the following BMPs to the extent practicable: utilize ultra-low sulfur diesel or other alternative fuels; utilize emission controls applicable to C&D equipment; and reduce idling time on equipment (Appendix A). C&D activities are not likely to significantly affect the climate on a global or regional scale.

4.7.3 No Action Alternative

Under the No Action Alternative, the Air Force would not implement the construction or demolition projects and existing facilities would continue to be used. As a result, there would be no additional construction emissions or impacts anticipated and emissions in the ROI would remain at or near the baseline levels.

4.8 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

This section addresses the potential impacts caused by hazardous materials and waste management practices and the impacts of existing contaminated sites (e.g., ERP) on the Proposed Action. The qualitative and quantitative assessment of impacts from hazardous

materials and hazardous waste management focuses on how and to what degree the alternatives affect hazardous materials usage and management, hazardous waste generation and management and waste disposal. A substantial increase in the quantity or toxicity of hazardous substances used or generated would be considered potentially significant. Significant impacts could result if a substantial increase in human health risk or environmental exposure was generated at a level that could not be mitigated to acceptable standards.

4.8.1 Proposed Action

All hazardous materials and C&D debris generated during execution of the Proposed Action would be handled, stored and disposed of in accordance with federal, state and local regulations and laws. Permits for handling and disposal of hazardous materials would be the responsibility of the contractor. Hazardous materials related to C&D would not be stored on base. All hazardous materials used at the construction site including, but not limited to, paint, paint thinners, gasoline, diesel, oil and lubricants shall be removed daily. Only quantities of hazardous materials required to carry out the work for the day would be permitted on site. Construction, demolition and renovation associated with the Proposed Action may require the use of hazardous materials by construction personnel. In accordance with the base's Hazardous Materials Pharmacy (HAZMART) procedure, copies of Material Safety Data Sheets must be provided to the base and maintained on the construction site. Construction personnel would comply with federal, state and local environmental laws and would employ affirmative procurement practices when economically and technically feasible. No adverse environmental consequences related to hazardous materials are expected from the construction, demolition and renovation associated with the proposed construction actions.

Hazardous waste, such as paints, adhesives and batteries, may be generated by construction personnel during the construction, demolition and renovation associated with the Proposed Action. Storage and disposal of these wastes would be coordinated by the site construction contractors with the base hazardous waste program manager. The amounts and types of hazardous wastes generated by base personnel during the operation and maintenance of each of the proposed facilities are not anticipated to change. No adverse environmental impacts related to hazardous wastes are expected from the continued use of these materials. In the event of fuel spillage during demolition or construction, the contractor would be responsible for its containment, clean up and related disposal costs. The contractor would have sufficient spill supplies readily available on the pumping vehicle and/or at the site to contain any spillage. In the event of a contractor-related release, the contractor would immediately notify the 20 CES and take appropriate actions to correct its cause and prevent future occurrences. Upon completion of the projects, contractors would be required to remove all hazardous materials and wastes from the work site.

Prior to any demolition activities associated with the Proposed Action, the affected facilities would be inspected to identify all ACMs, including Category I and Category II non-friable ACM and LBP. Table 3.8-1 lists known occurrences of ACM and expected occurrences of LBP

in structures to be demolished. Structures built before 1977 are expected to contain LBP. If ACMs or LBP are found in or near the demolition areas, then the following federal and state regulations must be followed.

- **Asbestos Removal and Disposal.** Upon classification as friable or non-friable, all waste ACM should be removed and disposed of in accordance with the SCDHEC Rule 61-86.1. Buildings containing ACM would require asbestos abatement as part of the demolition of the building.
- **LBP Removal and Disposal.** The proposed project should comply with the U.S. Department of Labor, Occupational Safety and Health Administration regulations and with the Sections 402, 403 and 404 of the Toxic Substances Control Act. Lead-containing materials would also be disposed of in accordance with applicable regulations.

All buildings, portions of buildings, and roadways affected would be surveyed for ACM/LBP. ACM/LBP and contaminated soil abatement would be undertaken in a manner consistent with applicable laws and regulations. No significant impacts are expected to occur under the Proposed Action.

Some of the components of the Proposed Action directly overlie ERP sites (overlie groundwater contamination plumes); however, none of the components of the Proposed Action are expected to directly interact with ERP sites (disturb contaminated soil or groundwater associated with an ERP site). Therefore, no impacts related to ERP sites are expected. Coordination with the 20 CES Asset Management Flight ERP Manager would be accomplished prior to any site preparation or construction to ensure that any necessary notices, waivers, manifests, approvals and/or permits are in place. The ERP Manager would also determine, on a project-by-project basis, if a Reporting Planned Changes document would be prepared and submitted to the SCDHEC in accordance with Permit Condition I.E.10 of the Shaw AFB Hazardous Waste Management Permit.

4.8.2 Alternative 1

Under Alternative 1, hazardous materials and hazardous wastes would be handled using the same procedures and precautions as would be used under the Proposed Action. ERP impacts would also be addressed in a similar fashion.

4.8.3 No Action Alternative

Under the No Action Alternative, construction, demolition and alteration associated with the CIP projects would not occur. There would be no environmental consequences to Hazardous Materials and Waste Management activities.

4.9 SAFETY

Impacts to safety are assessed according to the potential to increase or decrease safety risks to personnel, the public and property. Proposal-related activities are considered to determine if

additional or unique safety risks are associated with their undertakings. If any proposal-related activity indicated a major variance from existing conditions, it would be considered a safety impact.

4.9.1 Proposed Action

Short-term safety risks are associated with any demolition and construction activity, including those activities proposed as part of this action. However, adherence to standard safety practices would minimize any potential risks.

None of the proposed structures penetrate the airfield imaginary surfaces and none are located within designated CZ. Two of the defunct Base Engineering Facilities (Buildings 1707 and 1708) are located in the northern CZ and their removal would slightly improve safety conditions on Shaw AFB. The proposed visitors' center would be constructed within APZ I representing an incompatible land use. The visitors' center would be subject to an elevated potential for accidents. However, because this facility is a low-intensity use and would only be open during regular business hours, no waiver would be required prior to construction.

All proposed facilities would be in compliance with all applicable AT/FP standards and regulations including UFC 04-010-01, *DoD Minimum Antiterrorism Standards for Buildings*.

Two of the facilities proposed to be constructed under the Proposed Action would be the sites of storage, maintenance and handling of explosive material. Therefore, explosive Q-D arcs would be delineated surrounding these structures and the size of the Q-D arcs would be based on the types and amounts of explosives to be stored or handled at each location. The proposed Munitions Storage Magazine would be surrounded by a Q-D arc, and the proposed Arm/De-arm Pad would be surrounded by a Q-D arc. Siting of the proposed Munitions Storage Magazine within the existing Munitions Storage Area minimizes the total amount of land affected by Q-D arcs. No existing facilities would be newly affected by the Q-D arcs under the Proposed Action.

In addition to the two projects discussed above, the proposed Field Training Detachment Aircraft Maintenance Training Facility would be sited within a Q-D arc under the Proposed Action. Location of an inhabited facility in a Q-D arc is allowed when the primary function of the facility is directly related to explosives operations. Siting of the facility at the Proposed Action location may require a waiver and would result in increased explosives safety risks. If the structure were to be reinforced to be more resistant to explosions, safety risks associated with explosives could be reduced somewhat. Alternatively, aircraft parking space could be rearranged such that Q-D arcs no longer affect the site of the proposed facility.

Overall, safety impacts under the Proposed Action would be minor and insignificant in nature. Removal of two aboveground structures from the CZ would slightly improve safety at Shaw AFB. The construction of a visitors' center in APZ I would slightly decrease safety. Location of

a manpower intensive function (Field Training Detachment Aircraft Maintenance Training Facility) in a Q-D arc would slightly decrease safety.

4.9.2 Alternative 1

Safety impacts under Alternative 1 would be the same as impacts under the Proposed Action with two exceptions. Safety risks associated with C&D activities would be minimal and would last only for the duration of the projects. Two structures in the northern CZ would be demolished slightly decreasing safety risks. AT/FP standards would be followed in the site plans for all new facilities. Q-D arcs associated with the two munitions storage igloos and the Arm/De-arm Pad would be the same as under the Proposed Action. Alternative 1 would differ from the Proposed Action in that the proposed Field Training Detachment Aircraft Maintenance Training Facility would not be sited within a Q-D arc. As a result, safety impacts under Alternative 1 would be slightly less than safety impacts under the Proposed Action.

4.9.3 No Action Alternative

Under the No Action Alternative, the CIP would not be implemented and the proposed projects would not occur. Ground and flight safety risks would remain at current levels. No significant noise impacts would be anticipated.

4.10 NOISE

Noise impact analyses typically evaluate potential changes to existing noise environments resulting from proposed construction and demolition activities. This consists of changes in noise levels or the exposed human population, as well as noise impacts on wildlife. Potential changes in the noise environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels), negligible (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased exposure of sensitive receptors to unacceptable noise levels).

4.10.1 Proposed Action

Implementation of the Proposed Action would result in minor, temporary increases in localized noise levels in the vicinity of the project areas during development. Shaw AFB is an active military facility that typically experiences high noise levels from daily flight operations. Use of C&D equipment for site preparation and development (i.e., demolition, grading, fill and construction) would generate noise, which is not uncommon at Shaw AFB. It is expected that construction would be limited to normal working hours (i.e., between 7 a.m. and 5 p.m.). C&D noise could be reduced by the use of equipment sound mufflers. Table 4.10-1 shows sound levels associated with typical heavy construction equipment under varying modes of operation.

Table 4.10–1. Typical Equipment Sound Levels

Equipment	*Maximum Sound Level (in dB)*
Backhoe	70
Clam Shovel (Dropping)	79
Concrete Mixer Truck	71
Dozer	74
Generator	69

Note: 1. Measured at 125 feet
Source: Federal Highway Administration 2006

Compared with aircraft noise, noise produced by C&D would be relatively low in magnitude. The noise disruptions would be temporary and limited to daytime hours; therefore, impacts are not considered significant.

All of the facilities proposed to be constructed would be located in areas subject to noise from aircraft operations. Using the NOISEMAP modeling program, DoD produces contours showing noise levels generated by current aircraft operations. Table 4.10-2 lists noise levels, land use category and recommendation for noise attenuation for each proposed facility. Land use categories and noise attenuation recommendations are as per AFH 32-7084, *The AICUZ Program Manager's Guide* (Air Force 1999). Noise impacts resulting from siting the proposed facilities in high noise areas would be adverse, but not significant.

Table 4.10–2. Noise Levels, Land Use Category and Noise Attenuation Recommendation for Proposed Facilities under the Proposed Action
(Page 1 of 2)

Map ID	*Proposed Facility*	*Noise Zone (dB DNL)*	*Land Use Category*	*Special Noise Attenuation Measures Recommended*
4	Expand Building 1109 Communications Facility	75-80	Governmental Services	Yes
5	Construct United States Air Forces Central Command (USAFCENT) Operations Facility	<65	Governmental Services	No
6	Construct Field Training Detachment Aircraft Maintenance Training Facility	>85	Governmental Services	Yes
7	Construct Visitor's Center	80-84	Governmental Services	Yes
8	Construct Fire Satellite Station	75-84	Governmental Services	Yes
9	Construct new Operations Group/Maintenance Group Facility	75-79	Governmental Services	Yes
10	Expand Building 912, Chapel	75-79	Cultural Activities	Yes
11	Construct Aircraft Maintenance Mobility Equipment/Storage Facility	75-79	Miscellaneous Manufacturing	No
12	Munitions Storage Magazine (2 igloos)	75-79	Miscellaneous Manufacturing	No
13	Construct new Arm/De-arm pad	>85	Miscellaneous Manufacturing	No

Table 4.10–3. Noise Levels, Land Use Category and Noise Attenuation Recommendation for Proposed Facilities under the Proposed Action
(Page 2 of 2)

Map ID	*Proposed Facility*	*Noise Zone (dB DNL)*	*Land Use Category*	*Special Noise Attenuation Measures Recommended*
14	Construct new gate on east side of base with necessary road improvements	<65	Governmental Services	No
15	Road realignment at Main Gate around Visitor's Center	70-79	Highway and Street Right-of-Way	No
	Wateree Recreation Area Improvements including a new bath house, operations center and RV parking	<65	Resorts and Group Camps	No
23	Construct Vehicle Storage Yard	<65	Highway and Street Right-of-Way	No
26	Construct new 144-Person Dormitory	70-79	Group Quarters	Yes

4.10.2 Alternative 1

Under Alternative 1, the same construction projects that would occur under the Proposed Action would still occur. However, several projects would occur in alternative locations. Table 4.10-3 lists noise levels, land use category and recommendation for noise attenuation for each proposed facility. Construction noise impacts would be minimal in nature and of temporary duration as described in Section 4.10.1. Special attenuation measures would be recommended for administrative facilities in high noise zones (Air Force 1999). Noise impacts would be adverse, but not significant.

Table 4.10–4. Noise Levels, Land Use Category and Noise Attenuation Recommendation for Proposed Facilities under Alternative 1
(Page 1 of 2)

Map ID	*Proposed Facility*	*Noise Zone (dB DNL)*	*Land Use Category*	*Special Noise Attenuation Measures Recommended*
3	Renovate Airman Leadership School Building 400	70-74	Governmental Services	Yes
4	Expand Building 1109 Communications Facility	75-79	Governmental Services	Yes
5	Construct United States Air Forces Central Command (USAFCENT) Operations Facility	<65	Governmental Services	No
6	Demolish and Construct Building 1029 Field Training Detachment Aircraft Maintenance Training Facility at current location off Main Base	<65	Governmental Services	No
8	Construct Fire Satellite Station	75-84	Governmental Services	Yes
9	Construct new Operations Group/Maintenance Group Facility	75-79	Governmental Services	Yes

Table 4.10-3. Noise Levels, Land Use Category and Noise Attenuation Recommendation for Proposed Facilities under Alternative 1
(Page 2 of 2)

Map ID	*Proposed Facility*	*Noise Zone (dB DNL)*	*Land Use Category*	*Special Noise Attenuation Measures Recommended*
10	Expand Building 912, Chapel	75-79	Cultural Activities	Yes
12	Expand Existing Munitions Storage Magazine (2 igloos)	70-74	Miscellaneous Manufacturing	No
13	Construct new Arm/De-arm pad	>85	Miscellaneous Manufacturing	No
14	Construct new gate on east side of base with necessary road improvements	<65	Governmental Services	No
15	Road realignment at Main Gate around Visitor's Center	70-79	Highway and Street Right-of-Way	No
16	Expand Headquarters (HQ) United States Air Forces Central Command (USAFCENT) Building 1130 to northeast	75-79	Governmental Services	Yes
17	Renovate Existing Logistics Readiness Squadron Facility Building 1604	75-79	Governmental Services	Yes
19	Renovate Building 325 Vehicle Maintenance Facility	70-74	Governmental Services	Yes
21	Renovate Buildings 430 and 428	75-79	Governmental Services	Yes
26	Renovate Buildings 408 and 409	70-79	Group Quarters	Yes
23	Construct Vehicle Storage Yard	<65	Highway and Street Right-of-Way	No
	Wateree Recreation Area Improvements including a new bath house, operations center and RV parking	<65	Resorts and Group Camps	No
18	Demolish Building 700 and construct new Radar Approach Control facility	75-79	Governmental Services	Yes
20	Demolish Buildings 1517, 1501, 1211 and 1212 and construct new Armament Flight Maintenance and Storage Facility	80- >85	Governmental Services	Yes
22	Demolish Buildings 1821, 1830, 1832, 1836, 1850, 1851, 1852, 1856 and Construct 682nd Air Support Operations Squadron (ASOS) Complex	<65	Governmental Services	Yes

4.10.3 No Action Alternative

Under the No Action Alternative, the CIP would not be implemented and the proposed projects would not occur. No additional construction noise would be generated and the existing facilities would be subject to the same levels of aircraft noise as currently experienced. No significant noise impacts would be anticipated.

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5.0 CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

5.1 CUMULATIVE EFFECTS

This section provides (1) a definition of cumulative effects, (2) a description of past, present and reasonably foreseeable actions relevant to cumulative effects, (3) an assessment of the nature of interaction of the Proposed Action, Alternative 1 and the No Action Alternative with other actions, and (4) an evaluation of cumulative effects potentially resulting from these interactions.

5.1.1 Definition of Cumulative Effects

CEQ regulations stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR Part 1508.7). Recent CEQ guidance in *Considering Cumulative Effects* affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with the proposed action and alternatives. The scope must consider geographic and temporal overlaps and must also evaluate the nature of interactions among these actions.

Cumulative effects are most likely to arise when a relationship or synergism exists between a proposed action and alternatives and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to the proposed action would be expected to have more potential for a relationship than actions that may be geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects.

To identify cumulative effects, this EA analysis addresses three questions:

1. Does a relationship exist such that elements of the proposed action might interact with elements of past, present, or reasonably foreseeable actions?
2. If one or more of the elements of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?
3. If such a relationship exists, does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

In this EA, an effort has been made to identify all actions that are being considered and that are in the planning phase at this time. To the extent that details regarding such actions exist and the actions have a potential to interact with the proposed action in this EA, these actions are

included in this cumulative analysis. This approach enables decision-makers to have the most current information available so that they can evaluate the environmental consequences of the proposed action.

5.1.2 Past, Present and Reasonably Foreseeable Actions

This EA applies a stepped approach to provide decision-makers with not only the cumulative effects of the proposed action and alternatives but also the incremental contribution of past, present and reasonably foreseeable actions.

PAST ACTIONS RELEVANT TO THE PROPOSED ACTION AND ALTERNATIVES

Shaw AFB is an active military installation that undergoes continuous change in mission and in training requirements. This process of change is consistent with the U.S. defense requirement to be constantly ready to respond to changing threats to American interests throughout the world.

In 2002, Shaw AFB was home to four squadrons of F-16 Block 50 aircraft—three 18 Primary Mission Aircraft Inventory (PMAI) squadrons and one 24 PMAI squadron. In FY 2003, the Air Force deactivated one of the 18 aircraft squadrons and added 12 newer F-16 Block 50 aircraft to the 20 FW. Each of the three squadrons now has 24 PMAI Block 50 F-16 aircraft. Base personnel numbered 5,663 after this force structure change.

The base has completed construction of a new building to house the 28th Operational Weather Squadron and a new Dining Facility. EAs for the force structure change and this construction were completed and FONSIs were issued. Shaw AFB constructed an extension to their wastewater discharge pipe to the Wateree River. This action required a pumping station and approximately 5 miles of additional pipeline.

In FY 2003, a temporary training mission was established at Shaw AFB. To support the mission, approximately 8,400 SF of trailer space and 5,000 SF of maintenance area, along with 22 personnel were added to the base. This construction activity was environmentally assessed in 2002. Three Aircraft Maintenance Units (AMUs) were completed by 2005 to provide space for administration, supervision and training of personnel and storage of tools and supplies to support day-to-day flightline maintenance of fighter aircraft. The new AMUs totaled 36,000 SF and expenditures were estimated at $6.8 million. This project included the demolition of five facilities totaling 41,000 SF. This construction activity was environmentally assessed in 2002.

In 2007, Shaw AFB completed construction of a new library and deployment center. Improvements to the installation fenceline have also been recently completed. The improvements to the fenceline were analyzed and found to have no significant environmental impacts in 2005.

PRESENT ACTIONS RELEVANT TO THE PROPOSED ACTION AND ALTERNATIVES

The base, like any other major institution, also requires occasional new construction, facility improvements and infrastructure upgrades.

Shaw AFB is in the process of privatizing on-base MFH. In July 2009, a Finding of No Significant Impact (FONSI) was signed on an EA evaluating the conveyance of 340 acres of housing area with 1,436 existing housing units to a private contractor. The contractor is conducting renovation, demolition and construction resulting in a total of 1,005 military housing units. The demolition and construction is being conducted in phases in order to keep as many units as possible filled during the project. Several roads would be either realigned or constructed throughout the proposed MFH area and a new Shaw AFB gate would be constructed.

Several projects were analyzed for impacts as part of the WINDO Environmental Analysis (Air Force 2004a). The 17 projects analyzed as part of this EA were related to providing new or improved operational facilities, enhancing force protection, or improving the quality of life of base personnel. A FONSI was signed in July 2005 and the projects have been being completed, according to priority and the availability of funds, since that time.

Several beddown and realignment actions will take place at Shaw AFB in accordance with the BRAC Commission recommendations that became law on November 9, 2005. Actions include establishment of an ALQ-184 Pod Centralized Intermediate Repair Facility, relocation of TF-34 engine intermediate repair facilities to another base and beddown of HQ USARCENT at Shaw AFB. The environmental analysis for this action considered locating the command HQ building on the east side of Shaw AFB. A FONSI was signed for this EA on 24 July 2007.

Shaw AFB was chosen as the site for the establishment of a permanent air sovereignty alert mission. The alert mission is made up of 20 FW aircraft, which are parked on the South Ramp area while carrying out the alert mission. Q-D arcs will not affect any of the components of either the proposed action or alternatives. The action was categorically excluded.

In September 2008, an EA was prepared analyzing potential impacts of infrastructure improvements including alternative sites for the USARCENT headquarters on the west side of the base as well as a realignment of Shaw Drive, demolition of select golf course holes, relocation of the Main Gate and construction of a gate on Frierson Road on 46-acres of land to be acquired. A FONSI was signed in September 2008, recording no significant impacts from the implementation of these projects (Air Force 2008d). Many of the projects analyzed in the Infrastructure EA have not or will not be implemented. The USARCENT HQ is being constructed on the east side of the base as considered in the BRAC EA in 2007. The realignment of Shaw Drive and the north gate have not been implemented yet.

REASONABLY FORESEEABLE ACTIONS THAT INTERACT WITH THE PROPOSED ACTION AND ALTERNATIVES

This category of actions includes Air Force actions that have a potential to coincide, either partially in time or geographic extent, with the Proposed Action. Information on these actions is included to determine whether these actions would, if implemented, incrementally affect environmental resources. These recently proposed actions include:

Shaw AFB is also being considered as a potential location for the beddown of the F-35 Lightning II Joint Strike Fighter. Environmental analysis for that action has not yet begun.

5.1.3 Analysis of Cumulative Effects

The following analysis examines how the impacts of the actions presented above might be affected by those resulting from the Proposed Action, Alternative 1 and No Action Alternative at Shaw AFB, and whether such a relationship would result in potentially significant impacts not identified when the proposed action or alternatives are considered individually.

No specific projects have been identified that would produce incremental impacts when added to other past, present, or reasonably feasible future actions. Shaw AFB is an active military installation that undergoes changes in mission and in training requirements in response to defense policies, current threats and tactical and technological advances. The base population experiences periods of decline and growth with changing missions and the current base population is somewhat larger now than in the past. The base, like any other major institution (e.g., university, industrial complex), requires new construction, facility improvements, infrastructure upgrades and maintenance and repairs. All of these factors (i.e., mission changes, facility improvements and tenant use) will continue to occur before, during and after the Proposed Action if it is selected.

The base actions described in Section 5.1.2 affect specific areas on base and, for the most part, the scope of the actions is focused within those specific areas**.** None of these on-base actions would be expected to result in more than negligible impacts individually or cumulatively.

The cumulative effects of the proposed execution of the CIP would remain below the threshold of significance for all resource areas.

Land Use Resources. Construction activities associated with the Proposed Action and the planned and reasonably foreseeable actions have the potential to alter the existing land use designations as projects are completed and base development continues. However, these projects are intended to improve Shaw AFB's internal structure by consolidating similar functions and improving recreation opportunities and transportation flow throughout the base. All of the projects are expected to be consistent with Shaw AFB's current architecture and visual character. Therefore, while there would be minor beneficial impacts to land use from the

Proposed and related projects, significant cumulative impacts to land use, visual resources, recreation, or transportation are not expected.

Infrastructure. Planned and foreseeable activities within Shaw AFB could cumulatively impact available infrastructure due to the increase in personnel numbers. However, the increase in personnel has been analyzed and the impact on infrastructure has not been found to be significant. Shaw AFB is currently operating below capacity on all aspects of its infrastructure and the change in personnel and facilities is not expected to result in significant impacts.

Socioeconomics and Environmental Justice. Planned and foreseeable activities within Shaw AFB would likely have long-term beneficial impacts due to the increase in personnel and the ongoing contribution of construction expenditures in the local communities. The change in personnel would contribute to job growth and population growth. The construction activity, while temporary, would provide a beneficial impact on employment and revenue for suppliers of construction and related materials. However, due to the size of the surrounding communities, it is expected that Sumter County is capable of supporting the increase in personnel without significant adverse impacts to socioeconomic resources. In addition, the planned and foreseeable activities are not expected to result in significant impacts to environmental justice or risks to children. No adverse impacts from the additional activities have been identified; therefore, no disproportionate effects on minority or low-income populations are anticipated. For all construction activities, access to the construction sites would be restricted and construction noise would be temporary. Therefore, no significant cumulative impacts are anticipated for environmental justice or risks to children.

Cultural Resources. The Proposed Action is not expected to adversely impact the installation's cultural resources. Alternative 1 is also not expected to adversely impact the installation's cultural resources. The cultural resources at Shaw AFB are well documented and the procedures to protect them well established. Given the lack of adverse impact expected from the proposed or alternative action, together with the strong management program in place, potential cumulative effects on cultural resources should be small and entirely manageable.

Biological Resources. The Proposed Action and Alternative 1, in association with other on base construction projects, are unlikely to present cumulative effects on the biological resources at Shaw AFB including federal or state listed threatened and endangered species and other special status species. There are no threatened and endangered species known to occur in the Proposed Action or Alternative 1 project areas. The project areas do not, on whole, represent prime habitat for game species nor do they represent unique habitat. Given these conditions, no cumulative effects to biological resources are anticipated as a result of implementing the CIP presented in this EA.

Water Resources. The Proposed Action and Alternative 1, in association with other on base construction projects, are unlikely to present cumulative effects on the water resources at Shaw AFB including wetlands, floodplains, or groundwater. None of the construction sites considered as part of this EA are located in or adjacent to wetlands or floodplains and none of

the projects are scoped to intersect groundwater or produce additional demand for potable water. Previously completed NEPA actions of other projects have identified adverse, but not significant impacts to wetlands and floodplains. This action would not add to those impacts. Impacts to groundwater would be expected to be limited to minor net increases in total water usage when all projects are taken in combination. Given this backdrop and the employment of standard construction site BMPs, no adverse cumulative effects to water resources are expected as a result of the CIP analyzed in this EA.

Air Quality. C&D actions analyzed as part of this EA are expected to occur during the same time period as: MFH privatization, some portion of the 17 projects analyzed under the WINDO EA and some elements of the USARCENT HQ beddown. Each of these three actions is taking place over multiple years, but, for the purposes of environmental analysis, Air Quality emissions associated with these projects were calculated based on the 'worst-case' scenario that all projects would occur within a single year. Even if all of the projects associated with all of these EAs were to occur within a single year, emissions would not exceed 10 percent of total ROI emissions. Therefore, cumulative air quality impacts associated with the Proposed Action, Alternative 1 and the other known concurrent actions on Shaw AFB would not be significant.

Hazardous Materials and Waste Management. The Proposed Action, in association with other Shaw AFB construction projects, could contribute to cumulative effects associated with the disposal of hazardous materials such as asbestos and lead. All projects at Shaw AFB will comply with federal and South Carolina regulations concerning the handling and disposal of those materials, thus minimizing potential cumulative effects.

Safety. The Proposed Action and Alternative 1 do not include any actions that would result in cumulative safety impacts when taken together with other ongoing actions. All actions analyzed under this EA are in compliance with Air Force safety guidelines and AT/FP standards. New or revised Q-D arcs associated with facilities that would handle or store explosive materials would not affect any facilities constructed under other concurrent actions. The demolition of defunct Civil Engineer facilities in the northern CZ would slightly improve safety for the installation as a whole. Construction of a visitors' center in APZ I and construction of the Field Training Detachment Aircraft Maintenance Training Facility within an existing Q-D arc would pose safety risks for the inhabitants of those particular buildings. However, this impact would not affect persons in other structures on Shaw AFB.

Noise. The Proposed Action and Alternative 1 would result in minor increases in noise on Shaw AFB as a result of construction. In some instances, noise from the projects analyzed under this EA may overlap with noise resulting from other actions. While the combined noise of several concurrent C&D projects may be annoying to some persons, noise impacts would be temporary and limited to normal working hours. The EIAP for beddown of F-35 aircraft at Shaw AFB has not yet begun. If and when this process begins, a detailed analysis of noise impacts on Shaw AFB and surrounding areas would be conducted.

5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis include identification of "...any irreversible and irretrievable commitments of resources, which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of nonrenewable resource and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

For the Proposed Action and Alternative 1, most resource commitments are neither irreversible nor irretrievable. Those limited resources that may involve a possible irreversible or irretrievable commitment under the Proposed Action and Alternative 1 are discussed below.

Training operations at Shaw AFB associated with Shaw's mission and the proposed facilities construction would continue and involve consumption of nonrenewable resources, such as gasoline and diesel used in vehicles. None of these activities would be expected to significantly decrease the availability of minerals or petroleum resources.

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6.0 LIST OF PREPARERS

Sam Johnson, NEPA/EIAP Manager, 20 CES/CEAO
Associate Degree, Ecology, Community College of the Air Force, 1995
Years of Experience: 15

David M. Dischner, Program Manager
B.A., Urban Affairs, Virginia Polytechnic Institute and State University, Blacksburg, 1974
Hazardous Materials Management Certificate, University of California, Riverside, 1988
Years of Experience: 35

John K. Austin, Environmental Scientist
B.A., Biology, University of Virginia, Charlottesville, VA, 1999
Years of Experience: 9

Rachel D. Baxter, Environmental Scientist
B.A., Economics, University of Colorado, Colorado Springs, 2004
Years of Experience: 5

Brad S. Boykin, Air Quality Scientist
MBT, Biotechnology, Texas A&M University, 2004
B.S., Biomedical Science, Texas A&M University, 2002
Years of Experience: 5

Matthew Goss, Geologist
B.A., Geology, University of Massachusetts, Amherst, 1990
M.S., Geological Sciences, Rutgers University, Piscataway, NJ, 1992
Years of Experience: 14

Mike D. Nation, Geographic Information Systems
B.S., Environmental Science/Policy, University of West Florida, Pensacola, FL 2000
Years of Experience: 8

Howard B. Rock, Project Manager
B.A., Biology Virginia Wesleyan College, Norfolk, VA, 1974
Cultural Resources Management Certificate, University of Nevada, Reno, 1990
Years of Experience: 35

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7.0 REFERENCES

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Hovis, Julie (20 CES/CEAN). 2009. Personal communication by comment with Rachel Baxter, SAIC, on November 30, 2009.

Johnson, Samuel L. (Environmental Quality Manager, 20 CES/CEAO). 2006. Personal Communication by email with David Dister, Woolpert Inc., on November 2, 2006.

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APPENDIX A
INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING (IICEP)

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DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Mr. Charles Cantley
South Carolina State Historic Preservation Office
8301 Parkland Road
Columbia, SC 29223-4905

FROM: 20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152

SUBJECT: Shaw Air Force Base Capital Improvement Program Environmental Assessment

The United States Air Force is in the process of preparing an Environmental Assessment (EA) at Shaw Air Force Base (AFB), South Carolina to assess the potential environmental consequences associated with the implementation of the Capital Improvement Program.

The Capital Improvement Program consists of several elements including construction of a Logistics Readiness Squadron Facility, a 682nd Air Support Operations Squadron Complex, and expansion of the Headquarters 9th Air Force and a communications facility. Other projects include the demolition of a wastewater treatment plant chlorine chamber and a heat plant. Additionally, the Airman Leadership School would be demolished. A new Airman Leadership School Administrative facility would be constructed and a fire substation would be constructed near the north ramp. The enclosed map provides an overview of the construction and demolition projects being considered in this EA.

We are beginning the process of identifying applicable cultural resource information for areas within Shaw AFB. We would appreciate and assistance you could provide in identifying and retrieving this important information, as well as concerns you may have about the potential effects of the proposal on significant cultural resources.

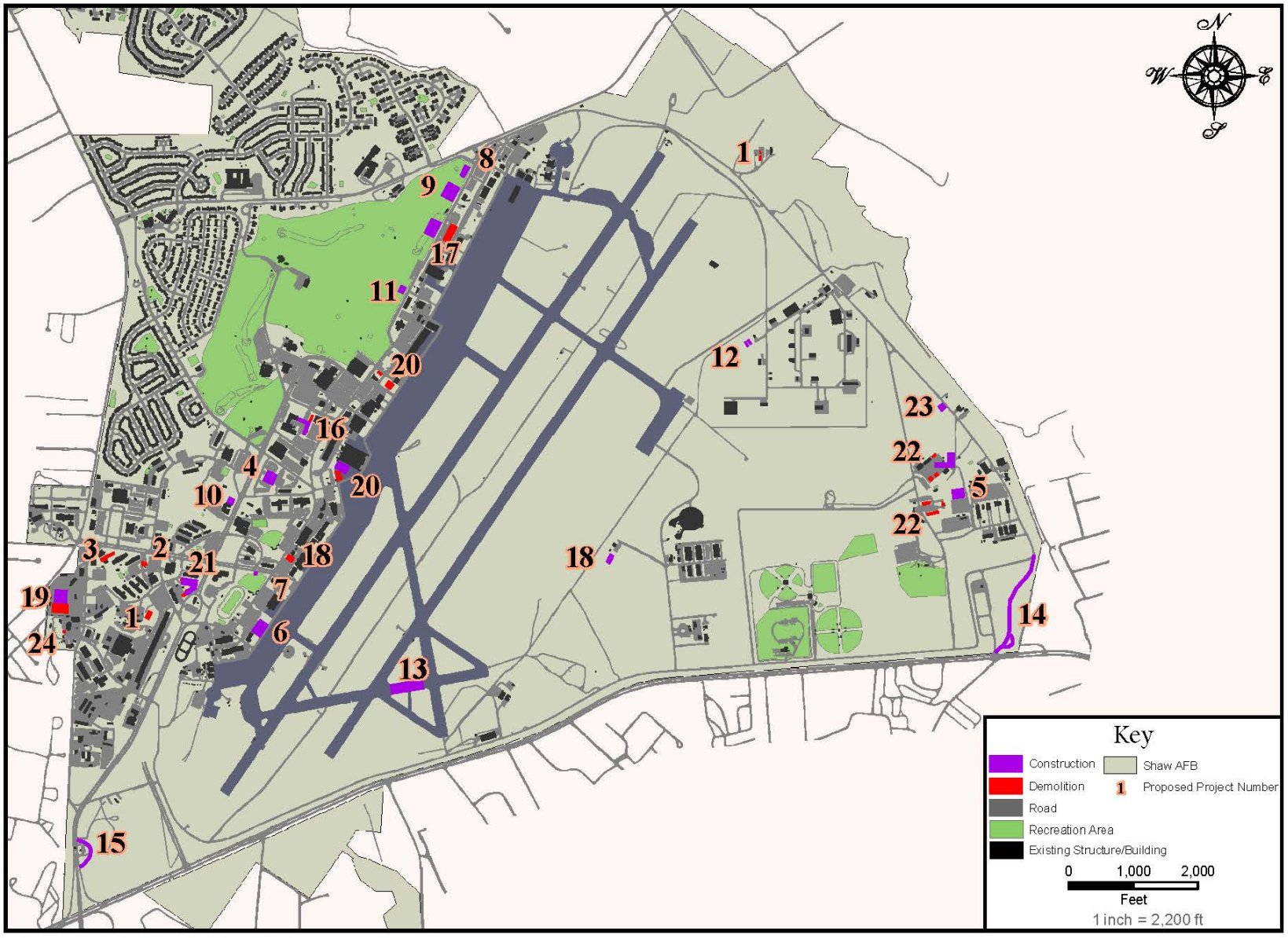
If you have any specific items of interest about the proposal, we would like to hear from you by November 16, 2009. Please contact the EA Project Manager, Mr. Sam Johnson, at 20 CES/CEAO, 428 Chapin Street, Shaw AFB, SC 29152 or at (803) 895-9999 with any questions or concerns that you or your staff may have. Thank you for your assistance in this matter.

Sincerely,

HEYWARD SINGLETON
Chief, Asset Optimization,
20th Civil Engineer Squadron

Attachment: Map of Capital Improvement Program projects.

Global Power For America



Proposed Locations for Construction Projects included in the Capital Improvement Program for Shaw AFB, SC

Construction Projects included in the Capital Improvement Program for Shaw AFB, SC

Project Title	*Map Location*
Demolition	
Demolish Base Engineer Facilities, Buildings 218, 1707, and 1708.	1
Demolish Building 403 Heat Plant	2
Demolish Building 400 Airman Leadership School	3
Demolish Wastewater Treatment Plant Chlorine Chambers	24
Expansion and New Construction	
Expand Building 1109 Communications Facility	4
Construct USCENTAF Operations Facility	5
Construct Field Training Detachment Aircraft Maintenance Training Facility	6
Construct Airman Leadership School Administrative Facility	7
Construct Fire Satellite Station	8
Construct new Operations Group/Maintenance Group Facility	9
Expand Building 912, Chapel	10
Construct Aircraft Maintenance Mobility Equipment/Storage Facility	11
Munitions Storage Magazine (2 igloos)	12
Construct new Arm/De-arm pad	13
Construct new gate on east side of base with necessary road improvements	14
Road realignment at Main Gate around Visitor's Center	15
Construct Vehicle Storage Yard	23
Wateree Recreation Area Improvements including a new bath house, operations center, and RV parking.	Located at Lake Wateree in Kershaw County, SC, 35 miles north of Shaw AFB (not shown on attached map)

Project Title	*Map Location*
Construction and Related Demolition	
Expand 9th Air Force Headquarters Building 1130 and Demolish Building 1128 and 1129	16
Demolish Building 1604 Existing Logistics Readiness Squadron Facility and Construct New Logistics Readiness Squadron Facility	17
Demolish Building 700 and construct new Radar Approach Control facility.	18
Demolish and replace with new construction Building 325 Vehicle Maintenance Facility	19
Demolish Buildings 1517, 1501, 1211, and 1212 and construct new Armament Flight Maintenance and Storage Facility	20
Demolish Buildings 430 and 428 and replace with new Dormitory	21
Demolish Buildings 1821, 1830, 1832, 1836, 1850, 1851, 1852, 1856 and Construct 682nd Air Support Operations Squadron Complex.	22

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Mr. Sam Hamilton
U.S. Fish and Wildlife Service Regional Office
1875 Century Blvd
Atlanta, GA 30345

FROM: 20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152

SUBJECT: Shaw Air Force Base Capital Improvement Program Environmental Assessment

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In association with the analysis and in compliance with the Endangered Species Act, we are requesting information regarding federally listed threatened, endangered, candidate and proposed to be listed species that occur on Shaw AFB. Please provide your response or any specific concerns by November 16, 2009 to the EA Project Manager, Mr. Sam Johnson, at 20 CES/CEAO, 428 Chapin Street, Shaw AFB, SC 29152 or at (803) 895-9999. Thank you for your assistance in this matter.

Sincerely,

HEYWARD SINGLETON
Chief, Asset Optimization,
20th Civil Engineer Squadron

Attachment: Map of Capital Improvement Program projects.

Global Power For America

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Ms. Julie Holling
South Carolina Department of Natural Resources
P.O. Box 167, Rembert C. Dennis Building
Columbia, SC 29201

FROM: 20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152

SUBJECT: Shaw Air Force Base Capital Improvement Program Environmental Assessment

The United States Air Force is in the process of preparing an Environmental Assessment (EA) at Shaw Air Force Base (AFB), South Carolina to assess the potential environmental consequences associated with the implementation of the Capital Improvement Program.

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Chief, Asset Optimization,
20th Civil Engineer Squadron

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Global Power For America

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: South Carolina State Clearinghouse
Office of State Budget
1201 Main Street, Suite 950
Columbia, SC 29201

FROM: 20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152

SUBJECT: Shaw Air Force Base Capital Improvement Program Environmental Assessment

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We request your assistance in identifying potential areas of environmental impact to be addressed in the EA. If you have any specific items of interest about the proposal, we would like to hear from you by November 16, 2009. Please contact the EA Project Manager, Mr. Sam Johnson, at 20 CES/CEAO, 428 Chapin Street, Shaw AFB, SC 29152 or at (803) 895-9999 with any questions or concerns that you or your staff may have. Thank you for your assistance in this matter.

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HEYWARD SINGLETON
Chief, Asset Optimization,
20th Civil Engineer Squadron

Attachment: Map of Capital Improvement Program projects.

Global Power For America

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Mr. Phil Degarmo
U.S. Fish and Wildlife Service Ecological Field Office
176 Croghan Spur Road, Suite 200
Charleston, SC 29407-7558

FROM: 20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152

SUBJECT: Shaw Air Force Base Capital Improvement Program Environmental Assessment

The United States Air Force is in the process of preparing an Environmental Assessment (EA) at Shaw Air Force Base (AFB), South Carolina to assess the potential environmental consequences associated with the implementation of the Capital Improvement Program.

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Sincerely,

HEYWARD SINGLETON
Chief, Asset Optimization,
20th Civil Engineer Squadron

Attachment: Map of Capital Improvement Program projects.

Global Power For America

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Chief Donald Wayne Rodgers
Catawba Indian Tribe
996 Avenue of the Nations
Rock Hill, SC 29730

FROM: 20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152

SUBJECT: Shaw Air Force Base Capital Improvement Program Environmental Assessment

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Sincerely,

HEYWARD SINGLETON
Chief, Asset Optimization,
20th Civil Engineer Squadron

Attachment: Map of Capital Improvement Program projects.

Global Power For America

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Honorable Joseph T. McElveen, Mayor
City of Sumter
P.O. Box 1449
Sumter, SC 29251

FROM: 20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152

SUBJECT: Shaw Air Force Base Capital Improvement Program Environmental Assessment

The United States Air Force is in the process of preparing an Environmental Assessment (EA) at Shaw Air Force Base (AFB), South Carolina to assess the potential environmental consequences associated with the implementation of the Capital Improvement Program.

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Sincerely,

HEYWARD SINGLETON
Chief, Asset Optimization,
20th Civil Engineer Squadron

Attachment: Map of Capital Improvement Program projects.

Global Power For America

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201

FROM: 20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152

SUBJECT: Shaw Air Force Base Capital Improvement Program Environmental Assessment

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Sincerely,

HEYWARD SINGLETON
Chief, Asset Optimization,
20th Civil Engineer Squadron

Attachment: Map of Capital Improvement Program projects.

Global Power For America

DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR: Ms. Vivian Fleming-McGhaney
Sumter County Council
13 East Canal Street
Sumter, SC 29150

FROM: 20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152

SUBJECT: Shaw Air Force Base Capital Improvement Program Environmental Assessment

The United States Air Force is in the process of preparing an Environmental Assessment (EA) at Shaw Air Force Base (AFB), South Carolina to assess the potential environmental consequences associated with the implementation of the Capital Improvement Program.

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Sincerely,

HEYWARD SINGLETON
Chief, Asset Optimization,
20th Civil Engineer Squadron

Attachment: Map of Capital Improvement Program projects.

Global Power For America

D H E C

PROMOTE PROTECT PROSPER

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment

October 28, 2009

Heyward Singleton
20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152

Re: Shaw Air Force Base Capital Improvement Program

Dear Mr. Singleton:

The map(s) enclosed with this correspondence are in response to your October 19, 2009 request for information regarding any potentially adverse environmental impacts in proximity to the project location(s) you provided. On the map(s) attached to this correspondence you will find "non-vulnerable"sites, within a half-mile radius of the selected project locations, that are either known, permitted or regulated by SCDHEC-BLWM and may adversely impact the project location(s). Excluded from the map output are sites that may adversely impact the project area but are designated by DHEC as "vulnerable" and therefore cannot be displayed on cartographic output provided to external parties. "Vulnerable" sites include Hazardous Waste Generators, Radiological Waste Generators and Nuclear Power Plants.

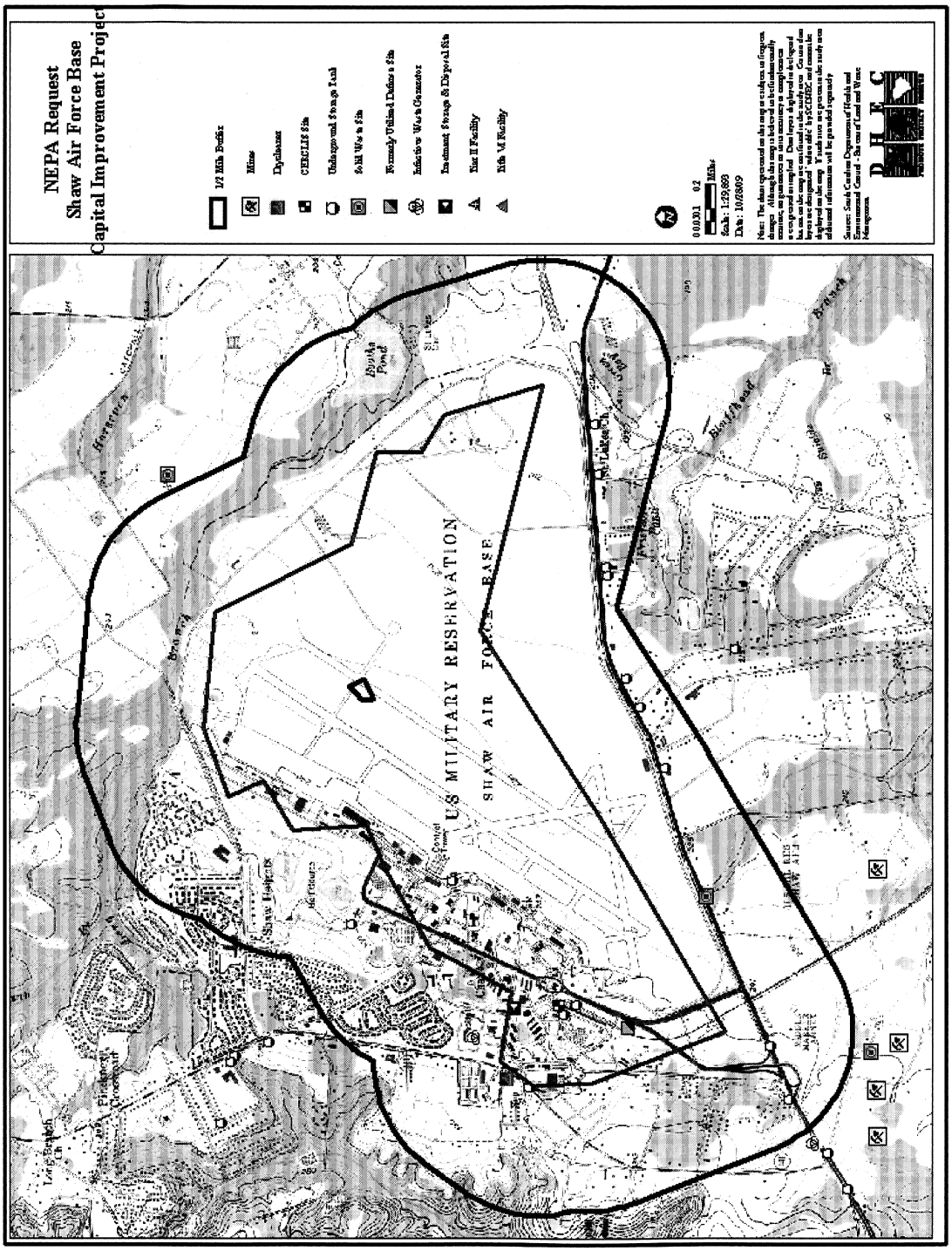
Please note that the data used to create the enclosed map(s) and any additional tables are subject to frequent changes. Although the data are believed to be fundamentally accurate, no guarantees as to the accuracy or completeness of the data are expressed or implied.

If you need further information regarding any site, you are encouraged to review the site file through a Freedom of Information (FOI) request. You may contact Mr. Jody Hamm with the SCDHEC FOI office at (803) 898-3817. If further information regarding this correspondence is required, please contact me at (803) 896-6942.

Sincerely,

Alison M. Hathcock, Permitting Coordinator
SCDHEC – Bureau of Land and Waste Management
2600 Bull St., Columbia, SC 29201
(803) 896-6942

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
2600 Bull Street • Columbia, SC 29201 • Phone: (803) 898-3432 • www.scdhec.gov


NEPA Request
Shaw Air Force Base
Capital Improvement Project
1/2 Mile Buffer
Mines
Drylosses
CERCLIS Sits
Underground Storage Tank
Solid Waste Sits
Formerly Utilized Defense Sits
Inductive Waste Generator
Treatment Storage & Disposal Sits
Haz H Facility
Haz M Facility
0 0.25 0.5 1 Miles
Scale: 1:29,000
Date: 10/2009
Source: South Carolina Department of Health and Environmental Control - Bureau of Land and Waste Management
DHEC
US MILITARY RESERVATION
SHAW AIR FORCE BASE

Cerclis

SITE_NAME	EPA_ID_NO	CITY_NAME	ZIP_CODE
SHAW AIR FORCE BASE	SC7570024466	SUMTER	29152

Drycleaner

FACILITY	ADDRESS_1	CITY_NAME	ZIP_CODE
TOM AND MARY'S PUT AND TAK	1784 PEACH ORCHARD RD (HWY. 441)	SUMTER	0

Formerly Utilized Defense Site

PROP_NAME	*PROP_NUM*
SHAW FIELD POW C	I04SC1011

Hazardous Generators

FAC	EPA_ID
EXXON LOCATION 4-3087	SCD98757829
G & K TANK SERVICES, INC.	SCD98757355
USAF SHAW AIR FORCE BASE	SC757002446

Infectious Waste Generator

IDENTIFIER	*ADDRESS_1*	*CITY*	*ZIP_CODE*	*STATE*
20TH MEDICAL GROUP SGSLF	431 MEADOWLARK ST	SHAW AIR FORCE BA	29152-5019	SC

Solid Waste Sites

FACILITY_N	STREET	CITY	STATE	ZIP
G&K Tank Services (Soil Treatment)	5070 Broad Street Ext.	Sumter	SC	29151

Underground Storage Tanks

FACILITY	STREET	CITY	STATE
AAFES SERVICE STATION SHOPPETTE	105 N SHAW DR	SUMTER	SC
AMERICAN GROCERY	4308 BROAD ST EXT	SUMTER	SC
BAILEY	4756 BROAD ST EXT	SUMTER	SC
COUSARS SUPERETTE	5443 BROAD ST EXT	SUMTER	SC
EL CHEAPO 8	4756 BROAD ST	SUMTER	SC
QUICK TRIP	4650 BROAD ST EXT	SUMTER	SC
SAFB BLDG 105	PATROL RD SHAW AIR FORCE BASE	SHAW AFB	SC
SAFB BLDG 1202	SHAW AFB	SHAW AFB	SC
SAFB BLDG 1602	SHAW AIR FORCE BASE	SHAW AFB	SC
SAFB BLDG 326	SHAW AIR FORCE BASE	SHAW AFB	SC
SAFB RAILHEAD UNLOADING	SHAW AIR FORCE BASE	SHAW AFB	SC
SHAW AIR FORCE BASE	345 CULLEN ST	SUMTER	SC
SHAW EXPRESS	1744 PEACH ORCHARD RD	SUMTER	SC
SOUTHLAND MOBILE HOME OF SUMTE	4444 BROAD ST EXT	SUMTER	SC
WINNERS CIRCLE 118	4330 BROAD ST EXT	SUMTER	SC
YOGI STOP	4010 BROAD ST	SUMTER	SC

South Carolina Department of
Natural Resources
DNR

John E. Frampton
Director
Ken Rentiers
Deputy Director for
Land, Water and Conservation Division

October 28, 2009

Mr. Sam Johnson, EA Project Manager
CES/CEAO
428 Chapin St.
Shaw AFB, SC 29152

RE: Shaw AFB Capital Improvement Program Environmental Assessment

Dear Mr. Johnson,

Because our database does not represent a comprehensive biological inventory of the state, I can only verify the known occurrences in the vicinity of your project. There may be occurrences of species in the vicinity of your project area that have not been reported to us. Fieldwork remains the responsibility of the investigator.

I have checked our database, and there is one known occurrence from 2001 of the state threatened *Sterna antillarum* (Least Tern) within the project area near the 16 and 20 map locations. As further indication of other species that may occur in the project area, I have also enclosed the list of rare, threatened, and endangered species for Sumter County.

As a professional courtesy, we ask that you acknowledge S.C. Heritage Trust as a source of information whenever you use this data in reports.

If you need additional assistance, please contact me by phone at 803-734-3917 or by e-mail at HollingJ@dnr.sc.gov.

Sincerely,

Julie Holling, Data Manager
SC Department of Natural Resources
Heritage Trust Program

Encl.

Rembert C. Dennis Building • 1000 Assembly Street • PO Box 167 • Columbia, SC 29202 • Telephone: 803-734-9100 • Fax: 803-734-9200
EQUAL OPPORTUNITY AGENCY www.dnr.sc.gov PRINTED ON RECYCLED PAPER

Rare, Threatened, and Endangered Species and Communities Known to Occur in Sumter County
October 28, 2009

Scientific Name	Common Name	USESA Designation	State Protection	Global Rank	State Rank
Vertebrate Animals					
Acipenser brevirostrum	Shortnose Sturgeon	LE: Listed endangered	SE-Endangered	G3	S3
Acris crepitans crepitans	Northern Cricket Frog			G5T5	S5
Corynorhinus rafinesquii	Rafinesque's Big-eared Bat		SE-Endangered	G3G4	S2?
Haliaeetus leucocephalus	Bald Eagle		SE-Endangered	G5	S2
Ictinia mississippiensis	Mississippi Kite			G5	S4
Micrurus fulvius	Eastern Coral Snake			G5	S2
Picoides borealis	Red-cockaded Woodpecker	LE: Listed endangered	SE-Endangered	G3	S2
Sterna antillarum	Least Tern		ST-Threatened	G4	S3
Ursus americanus	Black Bear			G5	S3?
Animal Assemblage					
Waterbird Colony				GNR	SNR
Vascular Plants					
Aristida condensata	Piedmont Three-awned Grass			G4?	S2
Carex decomposita	Cypress-knee Sedge			G3	S2
Carya myristiciformis	Nutmeg Hickory			G4	S2
Chamaedaphne calyculata	Leatherleaf			G5	SNR
Cyperus lecontei	Leconte Flatsedge			G4?	S1
Echinodorus tenellus	Dwarf Burhead			G5?	S2
Eleocharis robbinsii	Robbins Spikerush			G4G5	S2
Eupatorium recurvans	Coastal-plain Thorough-wort			G3G4Q	S1?
Lobelia boykinii	Boykin's Lobelia			G2G3	S3
Nestronia umbellula	Nestronia			G4	S3
Oxypolis canbyi	Canby's Dropwort	LE: Listed endangered		G2	S2
Plantago sparsiflora	Pineland Plantain			G3	S2
Rhexia aristosa	Awned Meadowbeauty			G3	S3
Rhexia cubensis	West Indian Meadow-beauty			G4G5	S1
Rhynchospora scirpoides	Long-beaked Baldrush			G4	S1
Ruellia caroliniensis ssp. ciliosa	Sandhills Wild Petunia			G5T3T5	S1
Sagittaria isoetiformis	Slender Arrow-head			G4?	S3

Scientific Name	Common Name	USESA Designation	State Protection	Global Rank	State Rank
Schwalbea americana	Chaffseed	LE: Listed endangered		G2G3	S3
Scleria baldwinii	Baldwin Nutrush			G4	S2
Communities					
Atlantic white cedar swamp				G2	S2
Bald cypress - tupelo gum swamp				G5	S4
Bottomland hardwoods				G5	S4
Depression meadow				G3	S2
Non-alluvial swamp forest				G5	S4S5
Oak - hickory forest				G5	S5
Pine - scrub oak sandhill				G4	S4
Pine flatwoods				G5	S3S4
Pine savanna				G3	S2
Pocosin				G3G4	S3S4
Pond cypress pond				G4	S4
Pond cypress savanna				G3	S2
Pond pine woodland				G4G5	S3
Small stream forest				G5	S5
Xeric sandhill scrub				G5	S3
Ecological					
Carolina bay				GNR	SNR

United States Department of the Interior

FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

October 29, 2009

Mr. Sam Johnson
20th CES/CEAO
Department of the Air Force
428 Chapin Street
Shaw Air Force Base, SC 29152

Re: Shaw Air Force Base Capital Improvement Program, Environment Assessment, Sumter, SC, FWS Log No. 42410-2010-SL-0046

Dear Ms. Johnson:

The U.S. Fish and Wildlife Service (Service) has received your notification of the Capital Improvement Program (CIP) to be implemented at the Shaw Air Force Base, Sumter County, SC. The Department of the Air Force (DAF) is soliciting information regarding federally listed species and critical habitat that may be impacted by the CIP as required by the Endangered Species Act (Act). Information received by the DAF will also be utilized in the preparation of an Environmental Assessment (EA) pursuant to the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended.

Briefly, the CIP includes the demolition of multiple buildings located at various locations on Shaw Air Force Base. Demolition of the buildings will be followed by the reconstruction of a new structure in the same location. In addition, a wastewater treatment chlorine chamber and heat plant will be demolished. A complete list of proposed activities will be provided in the EA.

A review of the Heritage Trust Database for South Carolina indicates that no threatened and endangered (T&E) species occur within the immediate area of Shaw Air Force Base. However, there remains the possibility that T&E species have been overlooked during past survey efforts. Therefore, the Service recommends that a new survey for T&E species be undertaken for the project area. Please find attached a list of T&E species that are known to or may occur in Sumter County. This list includes species of state and federal concern. Reconnaissance efforts must include a search for the federally listed T&E species. We also recommend the Shaw Air Force Base include all state listed species in its biological/ecological review. Please contact the S.C. Department of Natural Resources for further information on these species and their habitat requirements.

TAKE PRIDE® IN AMERICA

The Service appreciates the opportunity to provide comments and reserves the right to provide additional comments throughout the development of this project. If you have any questions concerning the submitted comments please contact the Service's project manager Mark Caldwell. He may be reached at the Service's Charleston field office, (843) 727-4707 ext 215.

Sincerely,

Joseph F. Caldwell

for Timothy N. Hall
Field Supervisor

TNH/MAC/km

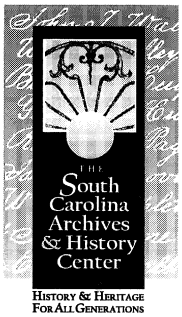
South Carolina Distribution Records of
Endangered, Threatened, Candidate and Species of Concern
March 2009

E	Federally endangered
T	Federally threatened
P	Proposed in the Federal Register
CH	Critical Habitat
BGEPA	Federally protected under the Bald and Golden Eagle Protection Act
C	The U.S. Fish and Wildlife Service or the National Marine Fisheries Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species
S/A	Federally protected due to similarity of appearance to a listed species
SC	Federal Species of concern. These species are rare or limited in distribution but are not currently legally protected under the Endangered Species Act.
*	Contact the National Marine Fisheries Service for more information on this species

These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated continually and may be different from the following.

SUMTER COUNTY

Bald eagle	Haliaeetus leucocephalus	BGEPA	Known
Red-cockaded woodpecker	Picoides borealis	E	Known
Shortnose sturgeon	Acipenser brevirostrum*	E	Known
Canby's dropwort	Oxypolis canbyi	E	Known
Chaff-seed	Schwalbea americana	E	Known
Southern Dusky Salamander	Desmognathus auriculatus	SC	Possible
Dwarf burhead	Echinodorus parvulus	SC	Known
Boykin's lobelia	Lobelia boykinii	SC	Known
Pineland plantain	Plantago sparsiflora	SC	Known
Awned meadowbeauty	Rhexia aristosa	SC	Known
Biltmore greenbrier	Smilax biltmoreana	SC	Known
Bachman's sparrow	Aimophia aestivalis	SC	Known
Henslow's sparrow	Ammodramus henslowii	SC	Known
American kestrel	Falco sparverius	SC	Possible
Loggerhead shrike	Lanius ludovicianus	SC	Possible
Painted bunting	Passerina ciris ciris	SC	Possible
Madtom, broadtail	Noturus sp 2	SC	Possible
Rafinesque's big-eared bat	Corynorhinus rafinesquii	SC	Known



November 12, 2009

Sam Johnson
Department of the Air Force
20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152

Re: Shaw AFB Capital Improvement Program, Sumter County, SC
SHPO #: 09CC0097

Dear Mr Johnson:

Thank you for letter of October 14 from Heyward Singleton, which we received on October 16, regarding the above referenced project. We also received a project description and a map as supporting documentation for this undertaking. The State Historic Preservation Office is providing comments to the United State Air Force pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR 800.

There is one National Register eligible building on Shaw Air Force Base: Building 611. If any demolition or construction should take place adjacent to that building, please send us notification and any applicable architectural. For projects not adjacent to Building 611, our office concurs with the assessment that no properties listed in or eligible for listing in the National Register of Historic Places will be affected by this project.

If archaeological materials are encountered during construction, the procedures codified at 36 CFR 800.13(b) will apply. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include, but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal and glass objects, and human skeletal materials. The federal agency or the applicant receiving federal assistance should contact our office immediately.

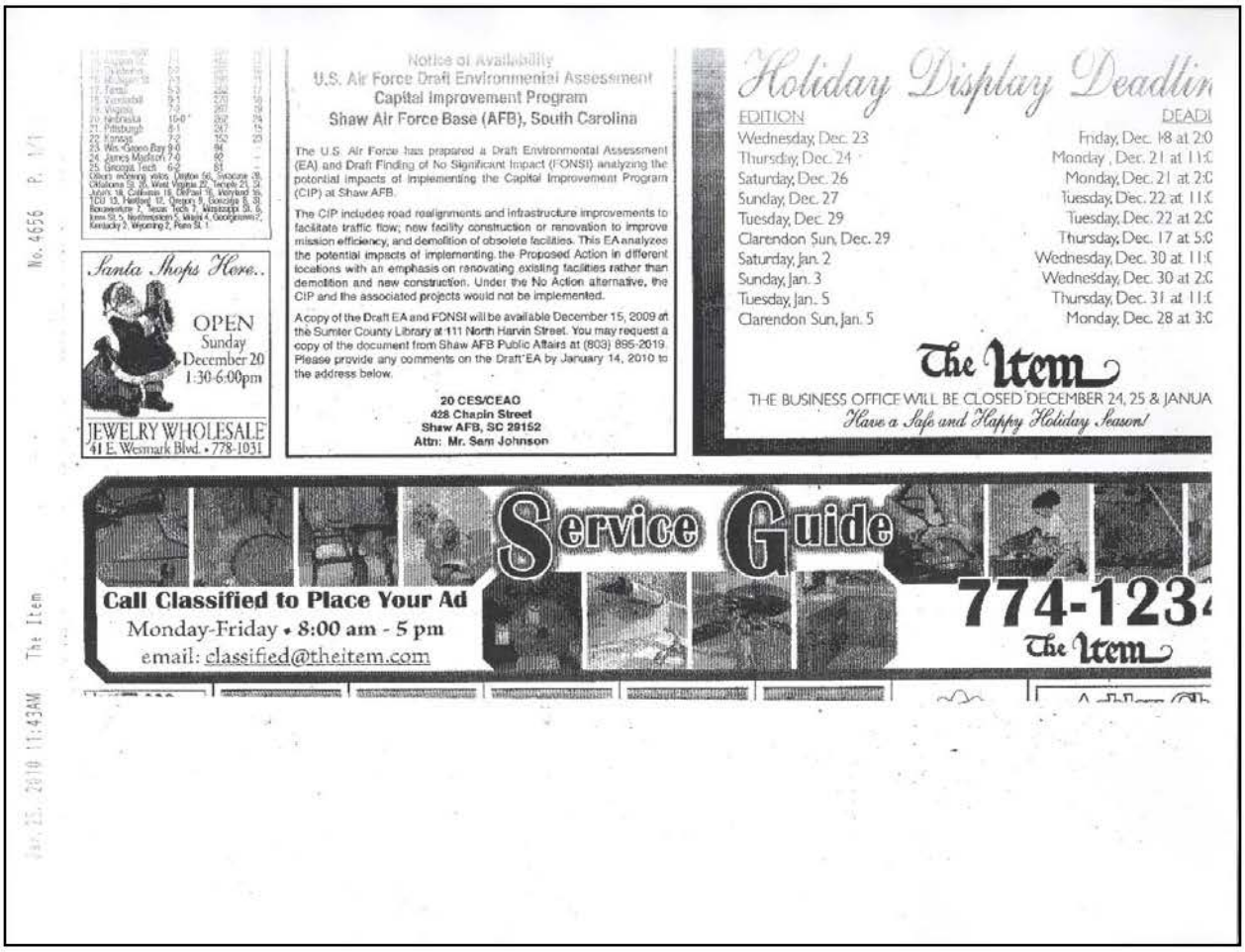
If you have any questions, please contact me at (803) 896-6169 or cwilson@scdah.state.sc.us.

Sincerely,

Caroline Dover Wilson
Review and Compliance Coordinator
State Historic Preservation Office

S. C. Department of Archives & History • 8301 Parklane Road • Columbia • South Carolina • 29223-4905 • (803) 896-6100 • http://scdah.sc.gov

Notice of Availability, Draft EA



Notice of Availability
U.S. Air Force Draft Environmental Assessment
Capital Improvement Program
Shaw Air Force Base (AFB), South Carolina

The U.S. Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) analyzing the potential impacts of implementing the Capital Improvement Program (CIP) at Shaw AFB.

The CIP includes road realignments and infrastructure improvements to facilitate traffic flow; new facility construction or renovation to improve mission efficiency, and demolition of obsolete facilities. This EA analyzes the potential impacts of implementing the Proposed Action in different locations with an emphasis on renovating existing facilities rather than demolition and new construction. Under the No Action alternative, the CIP and the associated projects would not be implemented.

A copy of the Draft EA and FONSI will be available December 15, 2009 at the Sumter County Library at 111 North Harvin Street. You may request a copy of the document from Shaw AFB Public Affairs at (803) 895-2019. Please provide any comments on the Draft EA by January 14, 2010 to the address below.

20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152
Attn: Mr. Sam Johnson

Holiday Display Deadlin

EDITION	DEADL
Wednesday, Dec. 23	Friday, Dec. 18 at 2:0
Thursday, Dec. 24	Monday , Dec. 21 at 11:0
Saturday, Dec. 26	Monday, Dec. 21 at 2:0
Sunday, Dec. 27	Tuesday, Dec. 22 at 11:0
Tuesday, Dec. 29	Tuesday, Dec. 22 at 2:0
Clarendon Sun, Dec. 29	Thursday, Dec. 17 at 5:0
Saturday, Jan. 2	Wednesday, Dec. 30 at 11:0
Sunday, Jan. 3	Wednesday, Dec. 30 at 2:0
Tuesday, Jan. 5	Thursday, Dec. 31 at 11:0
Clarendon Sun, Jan. 5	Monday, Dec. 28 at 3:0

The Item

THE BUSINESS OFFICE WILL BE CLOSED DECEMBER 24, 25 & JANUA
Have a Safe and Happy Holiday Season!

Santa Shops Here..
OPEN
Sunday
December 20
1:30-6:00pm
JEWELRY WHOLESALE
41 E. Wesmark Blvd. • 778-1031

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The Item

United States Department of the Interior

FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

January 6, 2010

Mr. Sam Johnson
20th CES/CEAO
Department of the Air Force
428 Chapin Street
Shaw Air Force Base, SC 29152

Re: Shaw Air Force Base Capital Improvement Program, Environmental Assessment, Sumter, SC, FWS Log No. 42410-2010-I-0124

Dear Mr. Johnson:

The U.S. Fish and Wildlife Service (Service) has received the Environmental Assessment (EA) for the Capital Improvement Program to be implemented at the Shaw Air Force Base, Sumter County, SC. The Department of the Air Force developed the EA to review project alternatives and their impacts to pursuant to the requirements of the National Environmental Policy Act of 1969, as amended.

Upon review of the EA, the preferred alternative and its lack of potential impacts to trust resources, the Service offers no comments on the project at this time. However, the Service reserves the right to provide additional comments throughout the development of this project. If you have any questions concerning the submitted comments please contact the Service's project manager Mark Caldwell at (843) 727-4707 ext. 215.

Sincerely,

Diane L. Lynch
Acting Field Supervisor

DLL/MAC

TAKE PRIDE IN AMERICA

From: Johnson, Samuel L Civ USAF ACC 20 CES/CEAO [samuel.johnson@SHAW.AF.MIL]
Sent: Wednesday, January 20, 2010 9:39 AM
To: Baxter, Rachel D.
Cc: Rock, Howard (Brad)
Subject: FW: Shaw AFB Draft EA

Archive and History comments.

-----Original Message-----
From: Wilson, Caroline D. [mailto:cwilson@SCDAH.STATE.SC.US]
Sent: Thursday, January 14, 2010 3:29 PM
To: Johnson, Samuel L Civ USAF ACC 20 CES/CEAO
Subject: Shaw AFB Draft EA

Mr Johnson:

We received a copy of the draft environmental assessment on December 16, 2009. We have reviewed it and concur with the finding of no significant impact. We do, however, request that we be notified before any buildings are demolished, constructed, or renovated; or any ground breaking activities take place.

Thank you,

Caroline Dover Wilson

Review and Compliance Coordinator

South Carolina Dept. of Archives and History

8301 Parklane Road

Columbia, SC 29223

(803) 896-6169

Fax: (803) 896-6167

1

D H E C

PROMOTE PROTECT PROSPER

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment.

January 12, 2010

Mr. Sam Johnson
EA Project Manager
20 CES/CEAO
428 Chapin Street
Shaw AFB, SC 29152

RE: Draft Environmental Assessment
Capital Improvement Program
Shaw Air Force Base

Dear Mr. Johnson:

The South Carolina Department of Health and Environmental Control has reviewed the above referenced document and offers the attached comments included in memoranda from Poole to Wilson, dated January 7, 2010 and from Roberts to Wilson, dated January 12, 2010. Please ensure that these comments are addressed in future documents and actions.

If you have any questions, please contact me at (803) 896-8955 or at wilsonmd@dhec.sc.gov.

Sincerely,

Shelly Wilson

Shelly Wilson
Federal Facilities Liaison
Environmental Quality Control

cc: Rachel Poole
Jimmy Owens
Nelson Roberts

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
2600 Bull Street • Columbia, SC 29201 • Phone: (803) 898-3432 • www.scdhec.gov

MEMORANDUM

To: Shelly Wilson
Federal Facilities Liaison
EQC Administration

From: Rachel D. Poole, Environmental Engineering Associate
Corrective Action Engineering Section
Division of Waste Management
Bureau of Land and Waste Management

CC: Juvenal Salomon, Shaw Air Force Base

Date: January 7, 2010

Re: Draft Finding of No Significant Impact & Environmental Assessment for Capital Improvement Program
Shaw Air Force Base (SAFB)
SC7 570 024 466

The Draft Finding of No Significant Impact & Environmental Assessment for Capital Improvement Program was received December 23, 2009. The Division of Waste Management reviewed the Report with respect to applicable sections of the South Carolina Hazardous Waste Management Regulations (SCHWMR) and the SAFB Hazardous Waste Management Permit (the Permit). Based on this review, please note the attached comments.

If you have any questions regarding this issue, please contact me at poolerd@dhec.sc.gov or (803) 896-4073.

Engineer Comments
Shaw Air Force Base (SAFB)
SC7 570 024 466
Rachel D. Poole
January 7, 2010

Re: *Draft Finding of No Significant Impact & Environmental Assessment for Capital Improvement Program (EA, December 2009)*

General Comments:

1. As shown by Table 3.8-2, many of the areas that will be disturbed for demolition or construction activities are within Environmental Restoration Program (ERP) sites. The groundwater in those areas is contaminated at multiple depths (shallow, intermediate, and deep). Any construction in that area has the potential to encounter contaminated subsurface soils and/or groundwater. However, according to Figure 2.2-1 and Table 2.2-1, the construction impact for the foundation of the proposed buildings is anticipated to be shallow as compared to the depth to contamination (Upper Black Creek Aquifer, approximately 100-150 ft), so no adverse effect is anticipated.

2. As per Permit condition I.E.10, prior to initiating any construction, a Reporting Planned Changes document must be submitted to the Department detailing any planned physical alterations or additions to the Permitted facility which may impact any Solid Waste Management Units, Areas of Concern, or the areas contaminated by them.

Specific Comments:

1. Section 3.8.2, Existing Conditions, Page 3-33 – The statement "only intermittent low-level detections in the Lower Black Creek Aquifer" is not incorrect. The Lower Black Creek Aquifer has a plume that consists of both perchloroethylene (PCE) and trichloroethylene (TCE) contamination. Please reference the AOC F (OT-16B) and AOC H (OT-16C) Corrective Measures Implementation Progress Report dated August 26, 2009.

2. Section 3.8.2, Existing Conditions, Page 3-33 – The revised Draft Corrective Measures Study (CMS) for AOC D (OT-16C) has not been submitted to the Department.

From: L. Nelson Roberts
To: Wilson, Shelly
CC: Baecker, R. Renee; Brown, Robbie
Date: 1/12/2010 1:26 PM
Subject: Shaw AFB EI comments

Shelly,
A few days ago, I was handed a packet of info regarding Shaw AFB and construction activities. I was asked to respond to you if we had any comments. We've taken a look at the document and offer the two comments below. If you have any questions, please give me a call. Thanks.

1. An asbestos survey and project license may be required prior to any demolition activities such as deconstruction of a bridge or removal of structures in the right-of-way of a road project. If you have any questions regarding asbestos regulatory applicability you may contact Robin Mack (with the Bureau's Asbestos Section) at (803) 898-4270 or mackrs@dhec.sc.gov.

2. The Bureau would like to offer the following suggestions on how this project can help us stay in compliance with the National Ambient Air Quality Standards (NAAQS). More importantly, these strategies are beneficial to the health of citizens of South Carolina.

§ Utilize Ultra-Low Sulfur Diesel or alternatively fueled equipment.

§ Utilize other emission controls that are applicable to your equipment.

§ Reduce idling time on equipment.

Nelson Roberts, Manager
SCDHEC - BAQ
Air Planning Section
Phone (803)898-4122
Fax (803)898-4487
robertln@dhec.sc.gov

BAQ- "A Best Workplace for Commuters"

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APPENDIX B
AIR QUALITY

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This appendix presents an overview of the Clean Air Act (CAA) and the South Carolina Air Quality program. The appendix also discusses emission factor development and calculations including assumptions employed in the air quality analyses presented in the Air Quality sections of Chapters 3 and 4.

B.1 AIR QUALITY PROGRAM OVERVIEW

B.1.1 National Ambient Air Quality Standards

In order to protect public health and welfare, the United States Environmental Protection Agency (USEPA) has developed numerical concentration-based standards or National Ambient Air Quality Standards (NAAQS) for six "criteria" pollutants (based on health related criteria) under the provisions of the CAA Amendments of 1970. There are two kinds of NAAQS: Primary and Secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air to protect public health including the health of "sensitive" populations such as asthmatics, children and the elderly. Secondary standards prescribe the maximum concentration or level of air quality required to protect public welfare including protection against decreased visibility, damage to animals, crops, vegetation and buildings (40 Code of Federal Regulations [CFR] Part 50).

The CAA (40 CFR Part 51) gives states the authority to establish air quality rules and regulations. These rules and regulations must be equivalent to, or more stringent than, the Federal program. The Federal ambient air quality standards are presented in Table B-1.

Based on measured ambient air pollutant concentrations, the USEPA designates areas of the United States (U.S.) as having air quality better than (attainment), worse than (nonattainment) the NAAQS and unclassifiable. Those that cannot be classified on the basis of available information as meeting or not meeting the NAAQS for a particular pollutant are "unclassifiable" and are treated as attainment until proven otherwise. Attainment areas can be further classified as "maintenance" areas. Maintenance areas are those areas previously classified as nonattainment and have successfully reduced air pollutant concentrations below the standard. Maintenance areas are under special maintenance plans and must operate under some of the nonattainment area plans to ensure compliance with the NAAQS. All areas of the state are in compliance with the NAAQS.

Table B-1. National and State Ambient Air Quality Standards

Criteria Pollutant	*Averaging Time*	*Federal Primary NAAQS*	*Federal Secondary NAAQS*
Carbon Monoxide (CO)	8-hour(1) 1-hour(1)	9 ppm (10 mg/m^3) 35 ppm (40 mg/m^3)	No standard No standard
Lead (Pb)	Rolling 3-month average Quarterly	0.15 µg/m3(2) 1.5 µg/m3	0.15 µg/m3 1.5 µg/m^3
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm (100 µg/m^3)	0.053 ppm (100 µg/m^3)
Particulate Matter ≤10 Micrometers (PM_{10})	24-hour(3)	150 µg/m^3	150 µg/m^3
Particulate Matter ≤2.5 Micrometers ($PM_{2.5}$)	Annual(4) 24-hour(5)	15 µg/m^3 35 µg/m^3	15 µg/m^3 35 µg/m^3
Ozone (O_3)	8-hour(6) 8-hour(7) 1-hour(8)	0.075 ppm (2008 std) 0.08 ppm (1997 std) 0.12 ppm	0.075 ppm 0.08 ppm 0.12 ppm
Sulfur Dioxide (SO_2)	Annual 24-hour(1) 3-hour	0.03 ppm (80 µg/m^3) 0.14 ppm (365 µg/m^3) No standard	No standard No standard 0.50 ppm (1300 µg/m^3)

(1) Not to be exceeded more than once per year.
(2) Final rule signed October 15, 2008.
(3) Not to be exceeded more than once per year on average over 3 years.
(4) To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.
(5) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).
(6) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)
(7) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(8) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.
(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.
Source: USEPA 2009

Each state is required to develop a State Implementation Plan (SIP) that sets forth how CAA provisions will be imposed within the state. The SIP is the primary means for the implementation, maintenance and enforcement of the measures needed to attain and maintain the NAAQS within each state and includes control measures, emissions limitations and other provisions required to attain and maintain the ambient air quality standards. The purpose of the SIP is twofold. First, it must provide a control strategy that will result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area.

South Carolina has a statewide air quality-monitoring network operated by both state and local environmental programs. Ambient air quality data from these monitors are used to assess the regions' air quality in comparison to the NAAQS. The air quality is monitored for carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter and sulfur dioxide (SO_2). The monitors tend to be concentrated in areas with the largest population densities. Not all pollutants are monitored in all areas. The air quality monitoring network is used to identify areas where the ambient air quality standards are being violated and plans are needed to reduce pollutant concentration levels to be in attainment with the standards, also included are areas where the ambient standards are being met but plans are necessary to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial growth (South Carolina Department of Health and Environmental Concern [SCDHEC] 2009).

The end-result of this attainment/maintenance analysis is the development of local and statewide strategies for controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in this process is the annual compilation of the ambient air monitoring results, and the second step is the analysis of the monitoring data for general air quality exceedances of the NAAQS as well as pollutant trends.

B.1.2 Conformity Rules

In accordance with Section 176(c) of the CAA, USEPA promulgated the General Conformity Rule that is codified at 40 CFR 51, Subpart W. The provisions of this rule apply to state review of all federal actions submitted pursuant to 40 CFR 51, Subpart W. The Conformity Rule only affects federal actions occurring in non-attainment areas (areas that do not meet the NAAQS) and maintenance areas (areas that were classified as non-attainment but now are in attainment). Since all of the Proposed and Alternative Actions are located in an attainment area, the Air Force would not need to prepare a conformity determination for the Proposed or Alternative Actions and alternatives. However, the general concept of the conformity rule was used as a criterion although not necessary.

B.1.3 Project Calculations

All project emissions calculations were calculated using the Air Force's Air Conformity Applicability Model (ACAM). This program has the ability to calculate all emissions associated with the various activities included in the Proposed Action and Alternative 1. Construction and

renovations associated with the Shaw AFB CIP were calculated for each of the facilities included in Tables 2.2-1 and 2.3-1. Emissions associated with renovations were assumed to be approximately 25 percent of the emissions that would be required for construction of a new facility of equal scope. Construction emissions calculations included stationary equipment, surface coatings and worker commuting trips. ACAM separates the construction actions into two phases: grading and the actual construction. In order to provide a conservative evaluation, both construction and demolition activities were assumed to be 10 percent larger than the building footprint. To further the conservative approach, for this analysis it was assumed that all of the construction and demolition projects associated with the Proposed Action would be completed in a one year period. Although it is highly unlikely that all projects could be completed in one year, by demonstrating that there would be no significant impacts associated with the maximum annual emissions associated with the project, it is apparent that conducting the projects over multiple years, would decrease annual emissions even further.

B.1.4 National Emissions Inventory

The National Emissions Inventory (NEI) is operated under USEPA's Emission Factor and Inventory Group, which prepares the national database of air emissions information with input from numerous State and local air agencies, from tribes, as well as from industry. The database contains information on stationary and mobile sources that emit criteria air pollutants and hazardous air pollutants. The database includes estimates of annual emissions, by source, of air pollutants in each area of the country, on an annual basis. The NEI includes emission estimates for all 50 States, the District of Columbia, Puerto Rico and the Virgin Islands. Emission estimates for individual point or major sources (facilities), as well as county level estimates for area, mobile and other sources, are available currently for 2002 for criteria pollutants and hazardous air pollutants.

Criteria air pollutants are those for which USEPA has set health-based standards. Four of the six criteria pollutants are included in the NEI database:

- Carbon Monoxide (CO)
- Nitrogen Oxides (NO_x)
- Sulfur Dioxide (SO_2)
- Particulate Matter (PM_{10} and $PM_{2.5}$)

The NEI also includes emissions of Volatile Organic Compounds (VOCs), which are O_3 precursors, emitted from motor vehicle fuel distribution and chemical manufacturing, as well as other solvent uses. VOCs react with NO_x in the atmosphere to form O_3. The NEI database defines three classes of criteria air pollutant sources:

- Point sources - stationary sources of emissions, such as an electric power plant, that can be identified by name and location. A "major" source emits a threshold amount (or more) of at least one criteria pollutant and must be inventoried and reported. Many

states also inventory and report stationary sources that emit amounts below the thresholds for each pollutant.

- Area sources - small point sources such as a home or office building, or a diffuse stationary source, such as wildfires or agricultural tilling. These sources do not individually produce sufficient emissions to qualify as point sources. Dry cleaners are one example, i.e., a single dry cleaner within an inventory area typically will not qualify as a point source, but collectively the emissions from all of the dry cleaning facilities in the inventory area may be significant and therefore must be included in the inventory.
- Mobile sources - any kind of vehicle or equipment with a gasoline or diesel engine; airplane; or ship.

The main sources of criteria pollutant emissions data for the NEI are:

- For electric generating units – USEPA's Emission Tracking System/Continuous Emissions Monitoring Data (ETS/CEM) and Department of Energy fuel use data.
- For other large stationary sources - state data and older inventories where state data was not submitted.
- For on-road mobile sources - the Federal Highway Administration's estimate of vehicle miles traveled and emission factors from USEPA's MOBILE Model.
- For non-road mobile sources – USEPA's NONROAD Model.
- For stationary area sources - state data, USEPA-developed estimates for some sources and older inventories where state or USEPA data was not submitted.

State and local environmental agencies supply most of the point source data. USEPA's Clean Air Market program supplies emissions data for electric power plants.

B.2 AIR EMISSIONS DATA

B.2.1 Project Calculations

All project emissions calculations were calculated using the Air Force's ACAM. This program has the ability to calculate all emissions associated with the various activities included in the Proposed Action. Construction and demolition associated with the Shaw CIP were calculated for each of the facilities included in Tables 2.2-1 and 2.3-1. Construction and demolition emissions calculations included stationary equipment, surface coatings and worker commuting trips. ACAM separates the construction actions into two phases: grading and the actual construction. The area of construction or demolition was considered to be 10 percent larger than the facilities' square footage footprint. In order to provide a conservative analysis it was assumed that the entire construction project would be completed in one year.

B.2.2 ACAM Output

The following images show the projected air emissions of criteria pollutants under the Proposed Action and Alternative 1 as provided by the ACAM program (Figures B-1 and B-2). This output includes the total emissions from all sources discussed above.

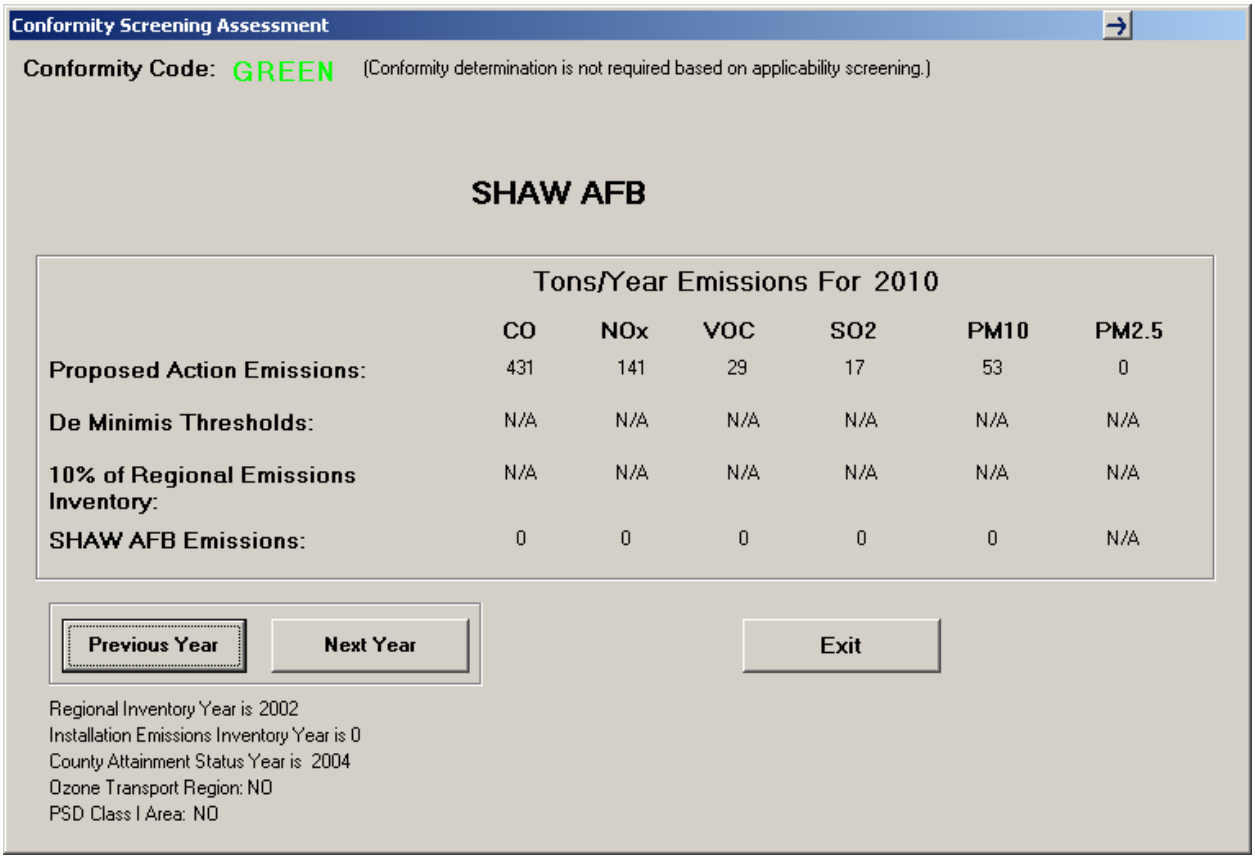

Figure B-1. Shaw AFB ACAM Output for the Proposed Action

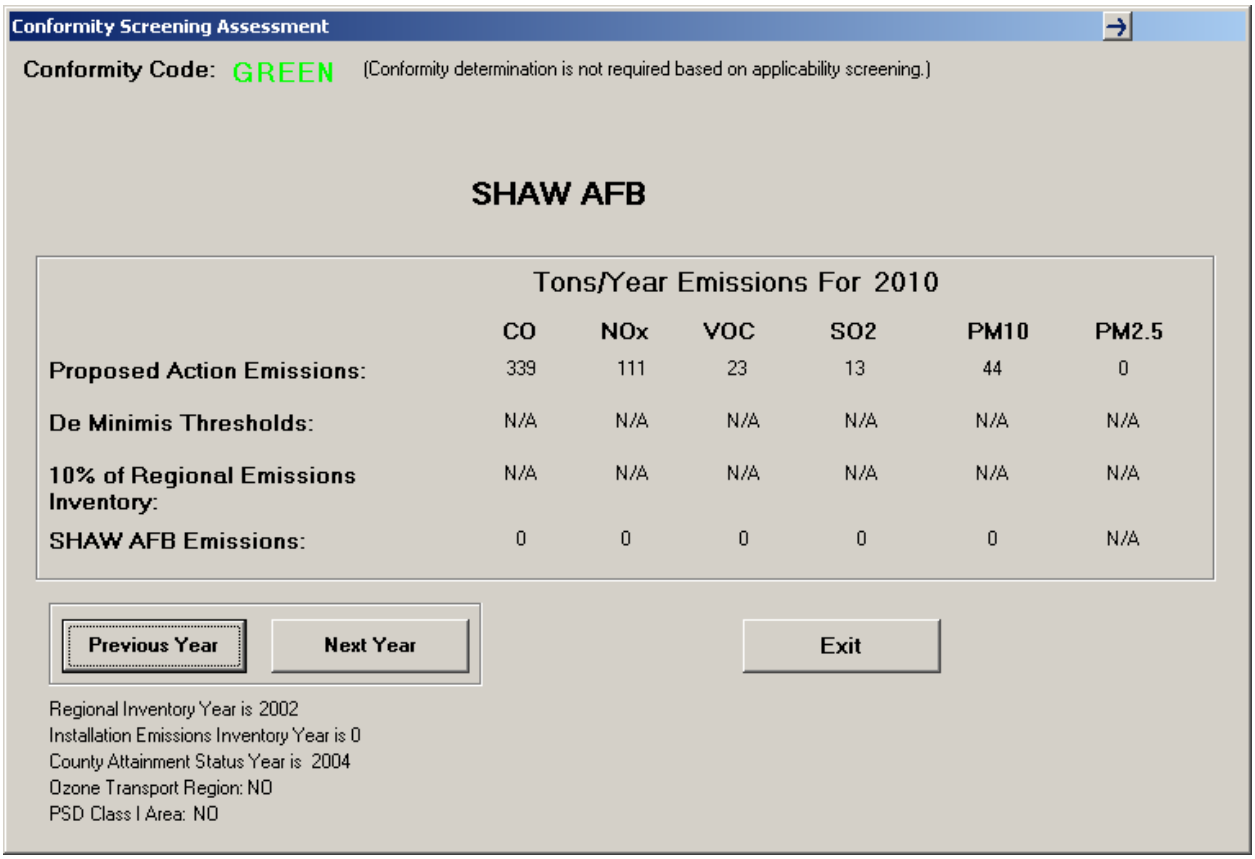

Figure B-2. Shaw AFB ACAM Output for Alternative 1

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